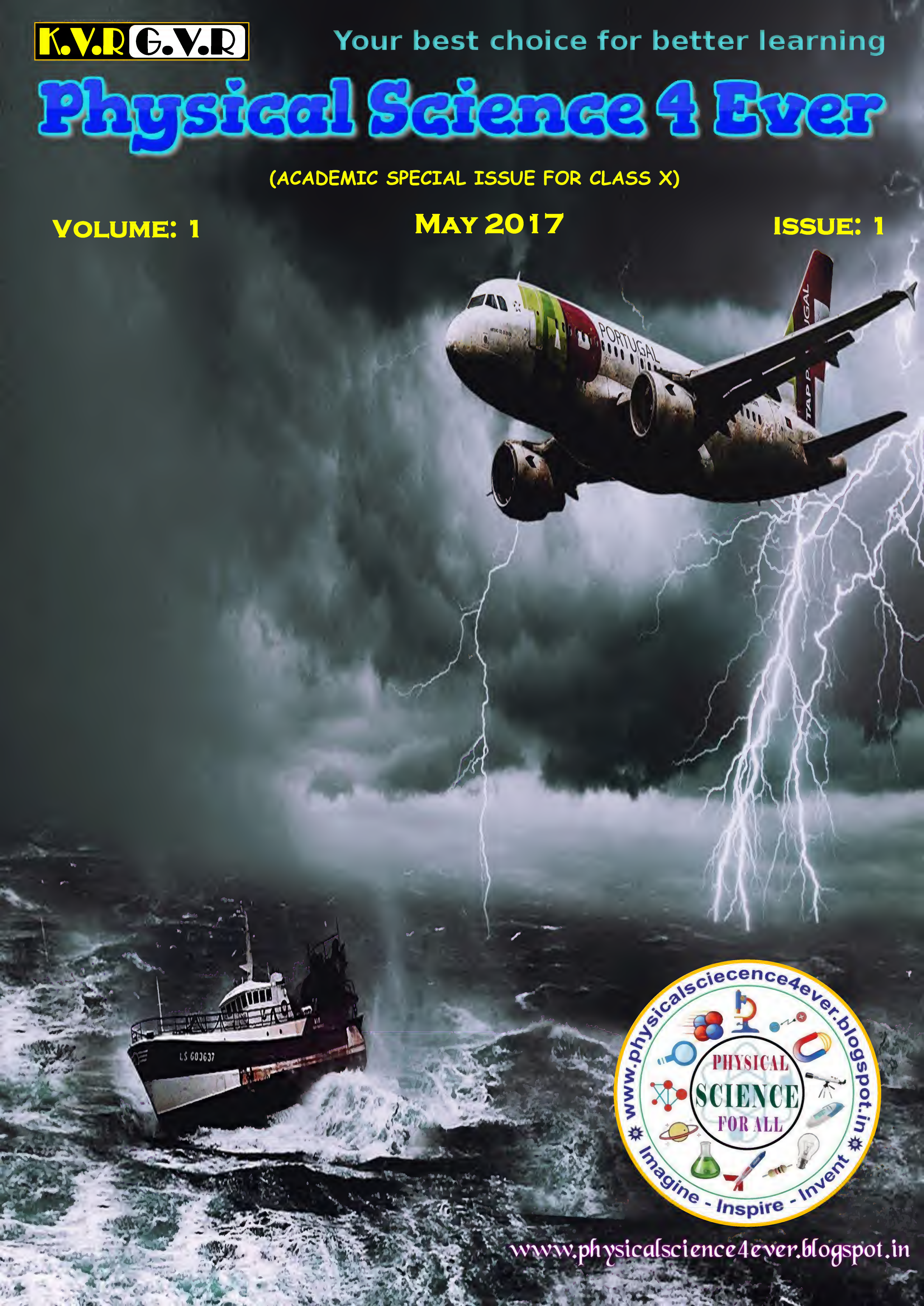
K.V.R G.V.R

Your best choice for better learning

Physical Science 4 Ever

(ACADEMIC SPECIAL ISSUE FOR CLASS X)

VOLUME: 1
MAY 2017
ISSUE: 1



www.physicalsciecence4ever.blogspot.in
PHYSICAL SCIENCE FOR ALL
Imagine - Inspire - Invent

www.physicalscience4ever.blogspot.in

The Lord Kelvin
(26 June 1824 – 17 December 1907)

Physical science 4ever
Academic special Issue for class X
May 2017
Volume: 1 **Issue: 1**

OUR BLOG

We created this blog for the usage of all physical science teachers and students in AP and TS.

This blog dedicates to Physical Science followers.

This blog gives more and more information about projects, CCE notes, CCE model FA and SA papers, lab activities, science fair information, latest science news (updates), lesson plans, mind maps, CCE type questions, quiz questions, physical science general essays, etc.,

Education Desk:
K.Venkataramana, M.Sc.,B.Ed
Srikakulam district – 532 001
☎ : 8008423323
E.Mail:kvr.lohith@gmail.com

G.V.Ramaprasad, M.Sc., B.Ed
Srikakulam District – 532 001
☎ : 7799884688
E.Mail:gamparamaprasad@gmail.com

CONTENTS

6

COVER STORY: The Bermuda Triangle is a loosely-defined region in the western part of the North Atlantic Ocean, where a number of aircraft and ships are said to have disappeared under mysterious circumstances.

23

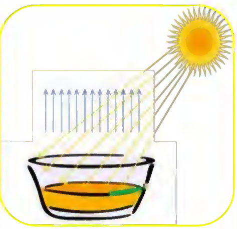
Lord Kelvin (William Thomson) was an eminent physicist with a wide range of interests and enthusiasms.
Best remembered for his talent for theoretical mathematics.

25

CCE Project: Collect the information about working of natural geyser.
Natural geysers are hot springs that intermittently throw up a jet of hot water, stream, etc.

29

Lab Activity: the factors affect the rate of evaporation.
The rate of evaporation of water depends on surface area, temperature or air pressure environment.



Editorial	***4***
Book Review	***5***
C.C.E Notes	***7***
Cross Word	***24***
Figures of the Month	***27***
CCE Bits	***28***
Mind mapping	***30***
Made easy Concept	***32***
DIY Project	***33***
CCE Model Questions	***34***
See it.... Do it...	***35***
Latest Science News	***37***
Homemade experiment	***38***
About the book	***40***

© All Copy Rights Reserved

This is only meant for private purpose. Not commercial

Editorial

"Kodite kottalira six kottali
Aadite aadalira raffadali
Baatedaina kani munumundu kellali
Potivunna kani gelupondi teerali
Ee charitralo niko konni pejilundali" which movie this song belongs to?

We think, the correct answer is recollecting in your mind while you sing this song. We know, you remember movie songs easy. Because you like movies very much. No…No… you are mad at movies. This is megastar Chiranjivi movie **Tagore** song.
You don't normally sing these type of songs observe and try to understand the motivational part from it.

The first line understood ***"Kodite yenugu kumbhastalaanne kottali".*** Means your goal must be bigger one.

The second line gives you read books more and more time, i.e., "***Pustakalanu raffadali".***

The third line tells you whatever your way to achieve your goal, you move forward without taking rest, i.e., **"*munumundu kellali".***

Then fourth line means although there is more competition, you work hard and must get success, i.e., ***"gelupondi teerali"***

Last line says in the history of the world some pages are allotted for great personalities. Like that you are also achieve your goal and become a famous personality to occupy some pages in the history book, i.e., **"Ee charitralo niko konni pejilundali"**

Remember, in the movie **MAGADHEERA,** Kalabhairava (Ram Charan) told Mitravinda (Kajal Agarwal), while explaining to shoot a target with arrow, "Your eyes concentrate only on the target", i.e., **"kanti chupu lakshyam mida vundaali"**

Like wise put your concentration only on the studies to achieve your goal.

Also remember the line from the song belongs to "***Naa autograph sweet memories" ; "anthuleni charitalaku aadi nuvvu kavali",*** *you will become the first person to create endless history.*

"Nothing is impossible with confidence perseverance and courage"

"Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do"

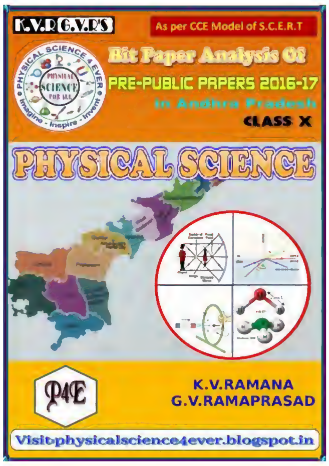
Learners those who are enter into the tenth class, we wish you all work hard with honesty, perseverance, confidence, concentration and get success in your life.

Think, Do and Achieve.

Yours
KVR & GVR

BOOK REVIEW

BIT PAPER ANALYSIS OF PRE-FINAL EXAMINATIONS (A.P) – 2016-17

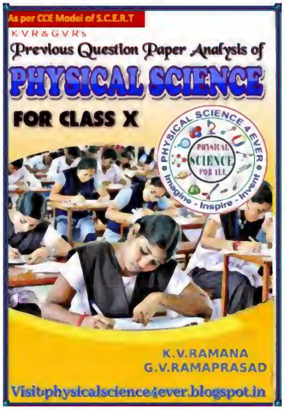


This book provides you bits analysis of Pre-Public papers 2016-17 in Andhra Pradesh for Class X. This book helps to all the physical science learners. We request to all the students try to read and learn all these bit papers. We think in the Public Examinations 2016-17 some of these Bits will come. So, prepare well and get good marks in your Public Exams.

Visit: www.physicalscience4ever.blogspot.in

Previous Question Paper Analysis : A.P & T.S

"This book provides you PREVIOUS PUBLIC PAPERS ANLYSIS. This is very useful to the public appearing students. From this book they easily access, which type of questions will ask in the upcoming public examination. They understand how the questions are twisted in CCE mode"


As per CCE Model of S.C.E.R.T
K.V.R & G.V.R's
Previous Question Paper Analysis of
PHYSICAL SCIENCE
FOR CLASS X
K.V.RAMANA
G.V.RAMAPRASAD
Visit:physicalscience4ever.blogspot.in

K.V.R G.V.R
Your best choice for better learning
Physical Science 4 Ever
(ACADEMIC SPECIAL ISSUE FOR CLASS X)
VOLUME: 1
MAY 2017
ISSUE: 1

Feedback

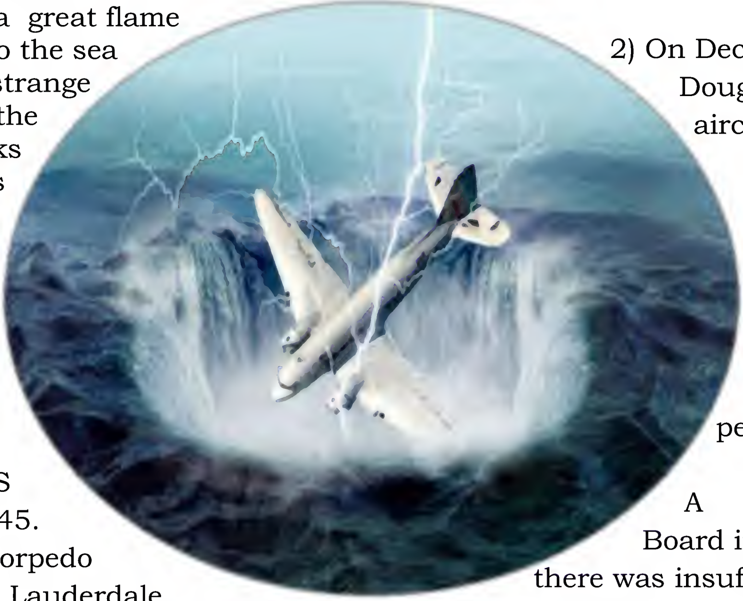
We invite your suggestions and advices to develop our academic special issues for more benefit to all learners. We publish your feedback with your name, school name, and place under this article. So, we request you to send your feedback to our Gmail ID: physicalscience4ever@gmail.com. Please tell us how you expect the next academic special issue. We will do our level best in our upcoming edition.

- Editors.

COVER STORY

BERMUDA TRIANGLE

The Bermuda Triangle is one of the science mysteries of the world. It is located in the Atlantic Ocean and is bounded by Miami, Bermuda and Puerto Rico. Here dozens of ships and airplanes have disappeared. Unexplained circumstances surround some of accidents, including one in which the pilots of a squadron of U.S. Navy bombers became disoriented while flying over the area; the planes were never found. Other boats and planes have seemingly vanished from the area these in good weather. The area referred to as the Bermuda riangle or Devil's Triangle, covers about 500,000 square miles of ocean off the southeastern tip of Florida. When Christopher Columbus sailed through the area on his first voyage to the New World, he reported that a great flame of fire crashed into the sea one night and that a strange light appeared in the distance a few weeks later. He wrote in his journals that inside this area, the watercraft's compass stopped working and he saw a fireball in the sky too.



One of the biggest and Famous losses of US Military occurred in 1945. Five US Navy Avenger torpedo bombers flew from Fort Lauderdale, Florida for a sortie to the island of Bimini. The mission had 14 men. After about 90 minutes, the radio operators received a signal that the compass was not working. After that the communication was lost. The bombers were never found. The three planes that went for their rescue also disappeared. The disappearances are ascribed to UFO's and alien activity, city of Atlantis lost under the triangle, and various other technical, natural and geographical reasons. At least 1000 lives are lost within the last 100 years. On average, 4 aircraft and 20 yachts go missing every year.

Some of Aircraft incidents:

1) G-AHNP Star Tiger disappeared on January 30, 1948, on a flight from the Azores to Bermuda; G-AGRE Star Ariel disappeared on January 17, 1949, on a flight from Bermuda to Kingston, Jamaica. Both were Avro Tudor IV passenger aircraft operated by British South American Airways Both planes were perating at the very limits of their range and the slightest error or fault in the equipment could keep them from reaching the small island. One plane was not heard from long before it would have entered the triangle.

2) On December 28, 1948, a Douglas DC - 3 aircraft, No: NC16002, disappeared while on a flight from San Juan, Puerto Rico, to Miami. No trace of the aircraft or the 32 people on board was ever found. A Civil aeronautics Board investigation found there was insufficient information available on which to determine probable cause of the disappearance.

Some of Incidents at sea:

1) 1800: USS Pickering, on course from Guadeloupe to Delaware, lost with 90 people on board.

2) 1814: USS Wasp (1814), last known position was the Caribbean, lost with 140 people on board.

Source: www.en.wikipedia.org

HEAT

The heat plays major a role in our daily life. It is used for cooking food, boiling water, drying wet clothes. The heat has many usages in the industry as extracting and processing the metals from their ores, manufacture of the food items, glass , the paper , the textile, etc,. High specific heat steam is used to run the rail engine, to generate electric current by rotate propellers of steam electric generators. Due to high specific heat of the water, the water in the swimming pool remains cool in summer and the people enjoy a lot staying inside the pool. The heat is used in Heat Therapy to reduce the body pains, the joint pains.

Hot and cold are relative terms and that heat was a form of energy.

Activity to understand Coldness and Hotness:

1) Keep a piece of wood and a piece of metal in a fridge or ice box for 15 minutes.
2) After 15 minutes take them out, we feel that they were cold, when we touch them.
3) When we touch metal piece or wooden piece, the heat energy is being transferred from our body to metal piece or wooden piece.
4) Therefore, we feel they are cold.
5) But, we feel that the metal piece is colder than the wooden piece.

Why does transfer of heat energy take place between objects?

Because of the temperature difference between objects they have difference in Kinetic Energy of their particles. For getting equal Kinetic Energy for their particles, heat energy takes place.

What could be the reason for difference in coldness?

When we touch the metal piece and wooden piece, the heat energy flows more out of our body to the metal piece compared to the wooden piece. So, we feel the metal piece is colder than the wooden piece.

Does it have any relation to the transfer of heat energy from our body to the object?

Yes, when heat energy flows out of our body we get the feeling of coldness and when heat energy enters our body we get a feeling of hotness.

Hotness and Coldness:

Coldness: When heat energy flows out of our body to any substance we get the feeling of coldness.

Ex: When we touch the metal piece which takes out from fridge, we feel it as cold, due to the heat energy is being transferred from our body to the metal piece.

Hotness: When heat energy enters our body (we get) from any substance we get a feeling of hotness.

Ex: When we bring our finger near the flame of matchstick, we feel hot because the heat energy transferred from the matchstick to our body.

This means, the “degree of hotness” of the metal piece is less than that of the matchstick.

Temperature (Def): The degree of hotness or coldness is called temperature. Also the intensity of heat is called temperature.

Temperature Units: The unit of temperature is **Degree Celsius (^0C)**, In SI system the unit is **Kelvin (K).**

Does transfer of heat take place in all situations?

No, when the bodies are in thermal equilibrium there is no transfer of heat. Also if the bodies are not in thermal contact there is no transfer of heat take place.

What are the conditions for transfer of heat energy?

Conditions:

1) *The two bodies must be in thermal contact.*
2) *The two bodies should have difference in temperature.*

Thermal Equilibrium Hotness and Coldness of our surroundings:

1) When two bodies are placed in thermal contact, then energy will be transferred from the 'hotter' body to the 'colder' body.

What change did you notice in the reading of the thermometer? (Mercury level)?

Did the mercury level increase or decrease?

The mercury level increases.

2) Transfer of heat energy continuous till both bodies attain the same degree of hotness (or) coldness.
3) When two bodies attain same degree of hotness (or) coldness, transfer of heat energy stops.
4) The state of thermal equilibrium denotes a state of a body where it neither receives nor gives out heat energy.

Did the level increase or decrease?

The mercury level decreases.

5) When two bodies are at same temperature and in contact, Thermal equilibrium takes place.
6) If we feel hot in our surroundings, the heat energy transferred from surroundings to our body. In this case:
   Colder body – our Body
   Hotter body – surroundings.
7) If we feel cold in our surroundings, the heat energy transferred from our body to surroundings. In this Case:
   Colder body – surroundings
   Hotter body – Our body

Heat – Activity on transfer of heat:

What is temperature?

The degree of hotness and coldness is called temperature.

How can you differentiate it from heat?

Temperature decides direction of the direction of flow of heat energy, but heat is the energy in transit, that flows from a body at higher temperature to a body at lower temperature.

1) Take two glass tumblers, one filled with hot water and another with cold water.
2) Keep a laboratory thermometer in hot water tumbler at first.
3) Because of heat got transferred from the hotter body (hot water) to the colder body (mercury in the thermometer), we observe that there is a raise in mercury level.
4) Next, place the thermometer in cold water tumbler and observe.
5) Because of the heat energy transferred from hotter body (mercury) to the colder body (cold water), we observe that the mercury level comes down.
6) Heat is a form of energy in transit that flows from a body at higher temperature to a body at lower temperature.
7) The steadiness of the mercury column of the thermometer indicates that flows of heat between the thermometer liquid (mercury) and water, has stopped.
8) The thermometer reading at thermal equilibrium gives the temperature.

Heat (Def): Heat is an energy that flows from a hotter body to colder body.

Heat Units: The SI unit of heat: **Joule (J).** C.G.S unit of heat: **Calorie (cal)**

Relation between Calorie and Joule:

1 Calorie = 4.186 Joules.

Calorie (Def): The amount of heat required to raise the temperature of 1 gram of water by 1^0C is called Calorie.

Relation or Conversion between Kelvin scale – Celsius Scale:

1. The S.I. unit of temperature is **Kelvin (K)**.

0^0 C = 273 K

Note: Kelvin denotes as ‘K’, not as ‘^{0}K’.

Temperature in Kelvin = 273 + temperature in degree Celsius

t^0C = (273 + t) K

How would you convert degree Celsius to Kelvin?

By add 273 to the value of the temperature in degree Celsius we convert it to Kelvin.

Ex: Conversion of 20^0C into Kelvin:

We know **t^0C = (273 + t) K**

Here, t = 20^0C.

20^0C = (273 + 20) K = 293K

Absolute temperature: The Temperature measured on Kelvin scale is called absolute temperature.

Temperature – Kinetic energy:

Activity showing the Kinetic energy of the particles depends upon the temperature:

Why does this happen?

Because the average K.E of the molecules in oil increases, while the average K.E of the molecules in water decreases.

1) Take two bowls one with hot water and second with cold water.
2) Sprinkle food color on the surface of the water in both bowls.

How do they move?

The food colour grains move randomly or jiggle.

Why do they move randomly?

Because the molecules of water in bowls moves randomly.

3) We observe that the jiggling of the grains of food color in hot water is more when compared to the jiggling in cold water.

Why do the grains in hot water move more rapidly than the grains in cold water?

Because the molecules in hot water have more K.E than the molecules of cold water.

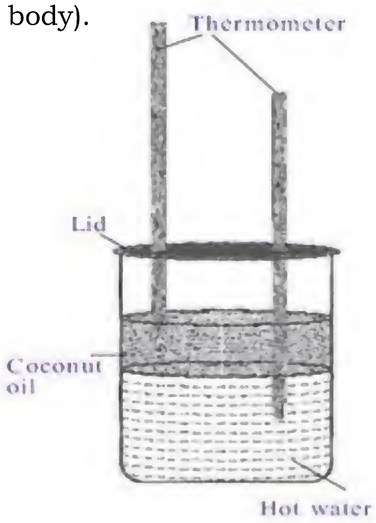
4) Bodies possess kinetic energy when they are in motion. We observe the kinetic energy of the particles in hot water is more when compared to the kinetic energy of the particles in cold water.
5) The temperature of the body is an indicator of the average kinetic energy of molecules of that body.
6) “The average kinetic energy of the molecules is directly proportional to the absolute temperature.

Average K.E. α T (in K)

Another activity on transfer of heat energy:

1) Take 60^0C hot water in a cylindrical transparent glass jar.
2) Gently pour coconut oil over the surface of the water.
3) Put two holed lid on it and insert two thermometers in the holes.
4) Insert one of the thermometers lies only in the water and other only in coconut oil.
5) Then we observe that, the reading of the thermometer kept in water decreases, at the same time the reading of the thermometer kept in oil increases.

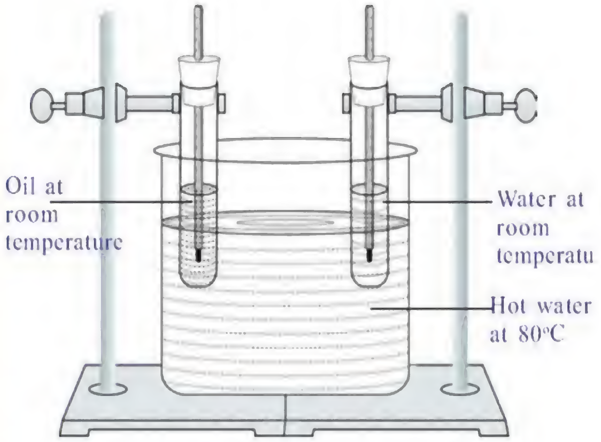
6) That means the heat energy flows from the hot water (hot body) to coconut oil (cold body).



Can you say that the water loses energy?
Yes, because of the temperature difference in between water and oil and water is hotter body, it loses energy.

Can you now differentiate between heat and temperature based on the discussion we made of the above activities?
Yes, Heat is the energy that flows from a hotter to a colder body. Temperature is a quantity that denotes which body is hotter and which is colder. So, temperature determines direction of heat (energy) flow, whereas heat is the energy that flows.

Specific Heat – Activity:
Comparison of rate of rise in temperature of oil and water:



1) Take 80^{0}C water in a large jar.
2) Take two test tubes, one filled with 50 g of water and other with 50 g of oil.
3) Insert two thermometers into two test tubes, with corks and place them in the hot water jar with clamp of a retort stand.
4) Observe the changes in the thermometer readings.

In which test tube does the temperature rise quickly?
The temperature rise quickly in the test tube filled with oil.

Are the amounts of heat given to the water and oil same? How can you assume this?
Same amount of heat given to the water and oil. Because they kept in the same bowl of water in the same time..

5) Although, the same amount of heat supplied to water and oil, we observe, the rate of rise in temperature of the oil is higher than that of the rise in temperature of the water.

Why does this happen?
Because the rate of rise in temperature depends on the nature of the substance.

6) The rate of rise in temperature depends on the nature of the substance.

Factors affecting the rate of rise in temperature:

a) Activity showing the rate of rise in temperature depends upon the mass of the substance:

1) Take two beakers of equal volume and take 250 grams of water in one beaker and 1kg of water in another beaker.
2) Note down their initial temperature using thermometers.
3) Heat both beakers till the temperature of water in the two beakers rises to 60^{0}C.

Which beaker needed more time?
The beaker in which has 1kg of water needed more time.

4) We need more time to raise the temperature of 1 Kg of water when compared with 250 grams of water.
5) That means you need to supply more heat energy to greater quantity of water than lesser quantity of water to attain same temperature.
6) For same change in temperature the amount of heat (Q) absorbed by a substance is directly proportional to its mass (m).

$\Rightarrow$ **Q α m** (when ΔT is constant)

b) Activity showing the rate of rise in temperature depends upon the amount of heat (Q) absorbed by the substance:

1) Take 1 liter of water in a beaker and heat it over a constant flame.
2) Note the temperature changes (ΔT) for every two minutes.

> ***What do you notice?***
>
> *We notice that the temperature rise with time in constant proportions.*

3) We will notice that the temperature rise with time in constant proportions.
4) That means, for the same mass (m) of water the change in temperature is proportional to the amount of heat (Q) absorbed by the substance.

$$\Rightarrow \mathbf{Q\ \alpha\ \Delta T}$$

Derivation of Q = msΔT
or
Derivation of equation for specific heat (S)
or Derivation of $S = \frac{Q}{m\Delta T}$
or
Relation between Heat (Q), Mass (m) and Change in temperature (ΔT):

1) For same change in temperature the amount of heat (Q) absorbed by a substance is directly proportion to its mass (m).

$$\Rightarrow \mathbf{Q\ \alpha\ m} \text{ - - - - - - - - - - I}$$

2) For same mass (m) of water the change in temperature is proportional to the amount of heat (Q) absorbed by it.

$$\Rightarrow \mathbf{Q\ \alpha\ \Delta T} \text{ - - - - - - - - - - II}$$

3) From the above I, II equations, we get

$$\Rightarrow \mathbf{Q\ \alpha\ m\ \Delta T}$$

$$\boxed{\mathbf{Q = m\ S\ \Delta T}}$$

4) The Constant 'S' in the above equation is called 'Specific heat' of the substance.

Specific Heat

$$\boxed{S = \frac{Q}{m\Delta T}}$$

Specific Heat:

Definition: The specific heat of substance is the amount of heat required to raise the temperature of unit mass of the substance by one unit. It is represented by 'S'.

$$\textbf{Specific Heat } S = \frac{Q}{m\Delta T}$$

> ***How much heat energy is required to raise the temperature of unit mass of substance by 1°C?***
>
> *Required energy is equal to its Specific Heat.*

Specific heat units:

C.G.S system: **cal/g ^{0}C.** S.I System: **J/Kg. K**

Relation between cal/g ⁰C and J/Kg. K:

1 cal/g ^{0}C = 4.2x10^3 J/Kg. K

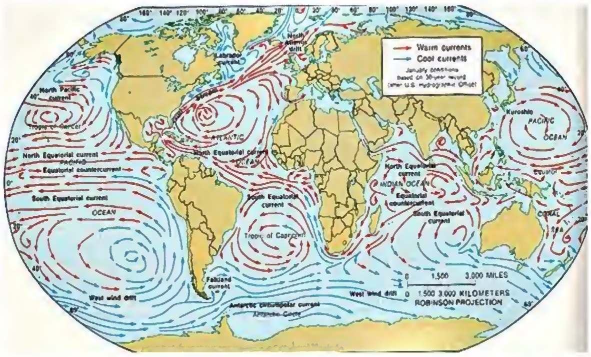
Relation between change in temperature and specific heat:

1) The rate of increase and the rate of decrease in temperature of a substance depend upon the nature of the substance and specific heat of the substance.
2) If the specific heat is high, the rate of rise or fall in temperature is low for same quantity of heat supplied.
3) It gives us an idea of the degree of '**reluctance**' of a substance to change its temperature.
4) High specific heat substances increase their temperature slowly and decrease their temperature slowly.

> ***Why is the specific heat different for different substances?***
>
> *Everybody has own internal energy, which is the sum of linear, rotational, vibrational and kinetic energies. Supplied heat energy will be shared to all of these energies. The sharing of given energy to Kinetic energy is different for different substances. Rise of KE gives rise in temperature. So, the specific heat is different for different substances.*

Applications of Specific Heat capacity:

1) Appreciation on the role of oceans in stabilizing atmospheric temperature.
2) Appreciation/Reason for stabilizing atmospheric temperature during summer and winter seasons.



3) Reason for a water melon brought out from the refrigerator retains its coolness for a longer time.

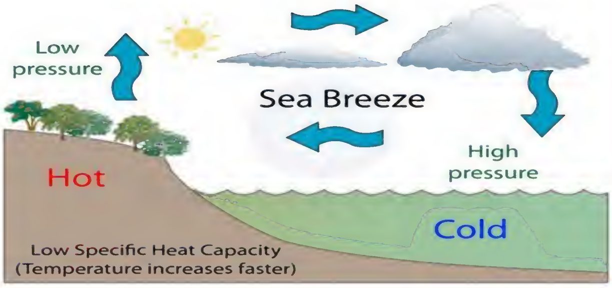
4) Reason for a Samosa/Alu Bonda/Mirchi Bajji/Veg or Egg Puff appears to be cool outside but it is hot inside.

I. Appreciation on the Role of oceans in stabilizing atmospheric temperature :

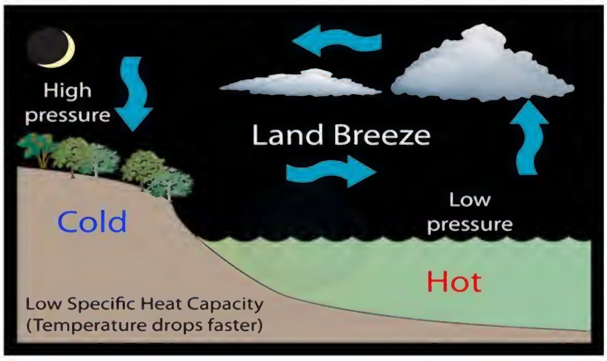
1) Heat energy transmits daily from sun to earth.
2) The oceans behave like "**heat store houses**' for the earth.
3) They can absorb large amounts of heat at the equator without appreciable rise in temperature due to high specific heat of water.
4) Therefore, oceans moderate the surrounding temperature near the equator.
5) Ocean water transports the heat away from the equator to areas closer to the north and south poles to moderate the climates in parts of the earth that are far from the equator.
6) So that we (I) appreciate the role of oceans in stabilizing atmospheric temperature.

II. Appreciation/Reason for Stabilizing atmospheric temperature during summer and winter seasons:

i. In summer season, due to high specific heat of the water, day time temperature of sea water (ocean water) increases very slowly, where as the temperature of the earth rise rapidly.
ii. Due to this, the air above the earth increases its temperature, expands, decreases density and the cold ocean air flows towards the earth and cools down the atmospheric temperature on land or earth.



iii. In winter season, night time the earth cools very fastly compared to ocean water by losses its heat.
iv. Air above the hotter ocean water expands, decrease density and hot air on the earth flows from the earth to oceans.



v. So, we appreciate the role of oceans in stabilizing the atmospheric temperature.

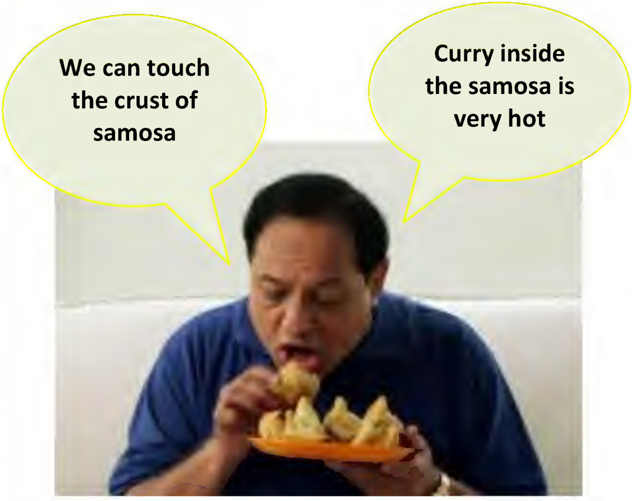
III. Reason for a water melon brought out from the refrigerator retains its coolness for a longer time:

i. Water melon contains a large percentage of water inside it and water has greater specific heat.
ii. The temperature of the water inside the water melon takes more time to increase.
iii. Hence, water melon retains its coolness for a longer time.

IV. Reason for a Samosa/Alubonda/ Mirchi Bajji/ Veg or Egg Puff/ appears to be cool outside but it is hot inside:

i. The inside substances of Samosa/Alu Bonda/Mirchi Bajji/Veg or Egg Puff have more specific heat and they retains hotness for a longer time.

ii. So, samosa appears to be cool outside, but it is hot when we eat it.


We can touch the crust of samosa
Curry inside the samosa is very hot

Method of mixtures:

Activities to understanding method of mixtures:

Situation-I
(Masses and Temperature same):

1) Take two beakers of the same size and pour 200 ml of water in each of them and heat the water in both beakers till they attain the same temperature.
2) If you pour this water from these two beakers into a larger beaker.

What do you observe?
The temperature of the mixture remains same.

What could be the reason for the fact you observed?
Because the masses, temperatures and the materials are same.

3) Due to the masses, temperatures and materials same, the temperature of the mixture be same.

Situation-II
(Masses same and Temperatures different):

1) 1. Take two beakers of the same size and pour 200 ml of water in each of them and heat the water in one beaker to 90°C and the other to 60°C and mix the water from these in larger beaker.

What will the temperature of the mixture be?
The temperature of the mixture is 75°C.

Measure temperature of the mixture. What did you notice?
The temperature is intermediate between the two temperatures.

Can you give reasons for the change in temperature?
Reason: Here
$m_1 = m_2 = m$, $T_1 = 90^{\circ}C$, $T_2 = 60^{\circ}C$.
Then the resultant temperature

$$T = \frac{m_1T_1 + m_2T_2}{m_1 + m_2} = \frac{mX\,90 + mX\,60}{m + m} = \frac{150m}{2m} = 75^{\circ}C$$

2) Then the mixture has the resultant 75°C (This is the average of the two temperatures).

Situation-II
(Masses different and Temperatures different):

1) Now take 100 ml of water at 90°C and 200 ml of water at 60°C and mix the two.

What is the temperature of the mixture?
The temperature of the mixture is 70°C.

What difference do you notice in the change of temperature?
It is not equal to the average of these two.

2) The resultant temperature T measured by the given formula.

$$T = \frac{m_1T_1 + m_2T_2}{m_1 + m_2}$$

Here m_1= 100 gm, m_2= 200 gm,
T_1= 90°C, T_2= 60°C.

Then the resultant temperature

$$T = \frac{m_1T_1+m_2T_2}{m_1+m_2} = \frac{(100X90)+(200X60)}{100+200} = \frac{21000}{300} = 70^oC$$

Note:

1) If we mix water of same masses and temperature the resultant temperature: **remains same (or) equal to any one of the temperatures.**
2) If we mix water of same masses and different temperatures the resultant temperature: **average of the temperatures (or) either equal to any one of the temperatures or in between maximum temperature and minimum temperature.**

Derivation of formula for resultant temperature of a mixture:

1) Let the initial temperature of the samples of mass m_1 and m_2 be T_1 and T_2.
2) Let T_1 is higher temperature and T_2 is lower temperature.
3) Let T be the final temperature of the mixture and it is lower than the temperature of the hotter sample but higher than the temperature of the colder sample.
4) The amount of heat lost by the hotter sample $\mathbf{Q_1 = m\ S\ (T_1\text{-}T)}$
   The amount of heat gained by the cooler sample $\mathbf{Q_2 = m\ S\ (T\text{-}T_2)}$
5) Since heat lost by the hotter sample is equal to the heat gained by the cooler sample. (Assuming no loss of heat)
   i.e., $Q_1 = Q_2$

$$m_1S(T_1 - T) = m_2S(T - T_2)$$

On simplification of the above equation,

$$T = \frac{m_1T_1 + m_2T_2}{m_1 + m_2}$$

Principle of method of mixtures (Definition):

When two or more bodies at different temperatures are brought into thermal contact, then net heat lost by the hot bodies is equal to net heat gained by the cold bodies until they attain thermal equilibrium. (If heat is not lost by any other process).

Net heat lost by the hotter body = Net heat gained by the cooler body

This is known as principle of method of mixtures.

Note: In this case both samples have same specific heat.

The procedure of finding specific heat of solid experimentally:

Method of determination of specific heat of a solid:

Aim: To find the specific heat of given solid.

Material Required: Calorimeter, stirrer, Thermometer, water, steam heater, wooden box and lead shots.

Procedure:

1) At first measure the mass (m_1) of the calorimeter along with stirrer.
2) Now fill one third of the volume of calorimeter with water and measure the mass (m_2)
3) Mass of the water inside the calorimeter = ($m_2 - m_1$)
4) Note the temperature (T_1) of the water inside the calorimeter and the calorimeter.
5) Place few lead shots in hot water or steam heater and heat up to 100°C (T_2)
6) Transfer the hot lead shots quickly into the calorimeter.
7) Measure the temperature (T_3) of the mixture after settles to a certain temperature.
8) Measure the mass (m_3) of the calorimeter along with contents.
9) Then the mass of the lead shots = ($m_3 - m_1$)
10) According to the principle of method of mixtures, the heat lost by the lead shots (solid) is equal to the heat gained by the calorimeter and water.

Heat lost by the Lead shots = Heat gain by the calorimeter + Heat gain by the water

$$(m_3 - m_2)S_l(T_2 - T_3) =$$
$$m_1S_c(T_3 - T_1) + (m_2 - m_1)S_w(T_3 - T_1)$$

$$S_l = \frac{[m_1S_c + (m_2 - m_1)S_w](T_3 - T_1)}{(m_3 - m_2)(T_2 - T_3)}$$

By using the above formula, we can calculate the specific heat of the solid (Lead shots)

Evaporation:

When wet clothes dry, we will notice that the water in the clothes disappears.

Where does the water go?
The water changes into water vapor and mix with water present in surrounding air, in the form of water vapor.

When the floor of the room is washed with water, the water on the floor disappears within minutes and the floor becomes dry.

Why does water on the floor disappear after some time?
Because of evaporation the water disappears on the floor.

Activity on Evaporation:

1) using a dropper, take few drops of spirit on your palm.

Why does your skin become colder?
Because the spirit absorbs heat from our palm and evaporates.

2) Spirit absorbs heat energy from our palm and evaporates. So our palm becomes colder.
3) When a liquid is exposed to air, the molecules at the surface keep on escaping from the surface till the entire liquid disappears in to air. This process is called evaporation.

Evaporation(Def): "The process of escaping of molecules from the surface of a liquid at any temperature is called evaporation" (or) "The change of phase from liquid to gas that occurs at the surface of the liquid."

Evaporation Process:

1) The molecules of liquid continuously move with random speeds in various directions and collide with other molecules.
2) During the collision they transfer energy to other molecules.
3) When the molecules inside the liquid collide with molecules at the surface, the molecules at the surface acquire energy and may fly off from the surface.
4) Some of these escaping molecules may be directed back into liquid, when they collide with the particles of air.
5) If the number of escaping molecules is greater than the number returned, then the number of molecules in the liquid decreases.
6) This process of the escaping of molecules from the surface of the liquid is called evaporation.

Evaporation – Cooling Process – The Temperature of the system falls:

1) The particles of liquid continuously give up their energy to the particles that are escaping from the surface and decrease the temperature of the system.
2) Therefore, evaporation is a cooling process.

Evaporation – Surface Phenomenon:

1) The particles of liquid continuously give up their energy to the particles that are escaping from the surface of the liquid.
2) That means evaporation takes place on the surface of the liquid only.
3) Therefore, evaporation is a surface phenomenon.

Evaporation – At any Temperature:

1) In the process of evaporation the particles of the liquid escape from the surface at any temperature.

Rate of Evaporation depends on:

1) Surface area.
2) Temperature.
3) Amount of vapour already present in the surrounding air.

Factors affecting evaporation:

1) Wind Speed on the surface.
2) Surface Area.
3) Humidity already present in the air.

a) Activity showing evaporation depends on the wind speed on the surface:

1) Take 1 ml of spirit in two Petri dishes.
2) Keep one of the dishes under a ceiling fan and switch on the fan keeps other closed with lid.

What do you notice?
We will notice that spirit in the dish kept under the fan disappears, where as some spirit left in the dish closed with lid.

3) After some time, you will notice that spirit in the dish kept under the fan disappears, where as some spirit left in the dish closed with lid.

> ***What could be the reason for this change?***
>
> *Because evaporation increases with increase the wind speed on the surface.*

4) The molecules escaped from the surface of the liquid by gaining energy by collision are flown away from the vicinity of the liquid.
5) That means, they lose the opportunity to return to the surface of the liquid.
6) So, the rate of evaporation increases with increase the wind speed on the surface.

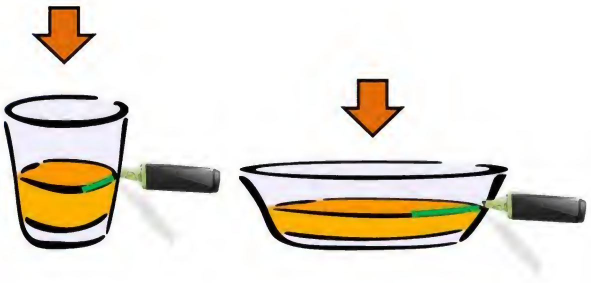
b) Activity showing evaporation depends on surface area:

1) Take 10 ml of spirit in a china dish and a test tube.
2) Keep them in outside air and observe.
3) We note that the spirit in the china dish evaporates fastly compared to the test tube.
4) Evaporation is surface phenomenon. The rate of evaporation increases with increase of surface area.

Application of Evaporation – Surface area:

Reason for when equal amounts of water are kept in a cap and in a dish, the water in the dish evaporates faster:

1) Evaporation is a surface phenomenon and if surface area increases then the rate of evaporation increases.
2) Dish has more surface area then cap.
3) So, the water in the dish evaporates faster than the water kept in a cap.



Evaporation depends on surface area

c) Activity showing evaporation depends on Humidity:

1) Take 1 ml of spirit in two Petri dishes.
2) Keep one of the dishes in the outside the class room (hot air) and other in the closed class room (cool air-more humid)
3) After some time, the volume of spirit remained in the dish kept outside the class room is less than that of in the closed class room.
4) So, if the humidity already present in the air is more, rate of evaporation is less.

Applications of Evaporation:

a. Wet clothes dry.
b. Disappear of water when washed the floor with water:
c. Appreciate the sweating mechanism of the human body (or) Stabilization of the temperature of the body.
d. Reason for dogs pant during hot summer days.

a) Wet clothes to dry:

1) when wet clothes dry, the water molecules from wet clothes, after evaporation, changes into water vapor and mix with water present in surrounding air, in the form of water vapor.
2) When wet clothes put under the sun light, the water molecules in the wet clothes absorb energy and moves randomly colloid each other.
3) By this collision, molecules on the surface absorb energy and change as water vapor and escape the surface. By this way water converts as water vapor.
4) Therefore, after some time the wet clothes dry.

Wet clothes dry

b) Disappear of water when washed the floor with water:

1) Generally after washing the floor of a room with water, we switch on the fan.
2) The water on the floor evaporates. It means water converts as water vapor and mix in the air.
3) So, after some time the water disappears on the floor.

c) Appreciation of the sweating mechanism of the human body (or) Stabilization of the temperature of the body:

1) When we do work, we spend our energy.
2) Energy release from our body as heat energy and the temperature of the skin become higher.
3) The water in the sweat glands starts evaporating and cools the body.
4) With this process, temperature of our body stabilized.
5) So, we appreciate the sweating mechanism of the human body.

Why do we sweat while doing work?
While doing work, our body temperature increases. To cools down the body we get sweat.

d) Reason for dogs pant during hot summer days:

1) In hot summer days the body of the dog gets heated.
2) Dogs don't have sweat glands.
3) By panting the water on the tongue evaporated.
4) Evaporation is a cooling process.
5) So, dogs pant during hot summer days and get their body cooled, due to evaporation.

Does the reverse process of evaporation take place?
Yes.

When and how does it take place?
When the vapour molecules lose their KE, their temperature decreases. Then they convert into droplets.

Condensation:

Activity of Condensation Process:

1) Pour cold water up to half of a glass tumbler or kept cold soft drink bottle in open air.

What do you observe on the outer surface of the tumbler?
We observe water droplets.

Why do water droplets form on the outer side of the glass?
Molecules of water in air lose their KE while colloid with the walls of the glass and form as water droplets.

2) After some time we observe some water droplets on the walls of the glass tumbler or cold soft drink bottle.
3) The water vapor present in the air moves randomly in all direction.
4) When these are strike the surface of the glass tumbler, loses their kinetic energy, decreases temperature and forms as water droplets.
5) The energy lost by the water molecules in the air are gained by the molecules of the glass tumbler and water inside the glass tumbler and decreases its coolness.
6) Condensation is the phase change from gas to liquid.

Condensation (Definition):

"The phase change of a gaseous state substance to liquid state by losing energy is called condensation".

Condensation – Warming Process:

1) The energy lost by the water molecules in the air is gained by the molecules of the glass tumbler or cold soft drink bottle molecules and the average KE of the glass molecules or cold soft drink bottle molecules increases.
2) In turn the energy is transferred from glass molecules of cold soft drink bottle molecules to the water or drink molecules in the glass or cold soft drink bottle.
3) Therefore, condensation is a warming process.

Applications of Condensation:

a) Formation of water droplets on the walls of the glass tumbler, when pour cold water into it.
b) Formation of dew on the surface of the cold soft drink bottle.
c) Feel warm after bath with cold water.
d) Condensation of vapour phase of H_2O

a) Formation of water droplets on the walls of the glass tumbler, when pour cold water into it:

1) When we pour cold water into the galss tumbler, after some time we observe water droplets on the walls of the glass tumbler.
2) Water molecules present in the air moves randomly in all directions and colloid with the walls of the glass tumbler.
3) When these are strike the surface of the glass tumbler, loses their kinetic energy, decreases temperature and forms as water droplets.
4) The energy lost by the water molecules in the air are gained by the molecules of the glass tumbler and water inside the glass tumbler and decreases its coolness (increases its temperature).
5) Condensation is the phase change from gas to liquid.

b) Formation of dew on the surface of the cold soft drink bottle:

1) The temperature of a cold soft drink bottle taken from the fridge is very less.
2) The water vapor molecules in the air collide with the surface of the cold soft drink bottle loses their energy and form as water droplets (dew).
3) This process is called condensation.
4) By this way the water vapor in the air condensed on the surface of the cold soft drink bottle and forms dew.

c) Feel warm after bath with cold water:

1) In the bathroom, the number of vapour molecules per unit volume is greater than the number of vapour molecules per unit volume outside the bathroom.
2) When you try to dry yourself with a towel, the vapour molecules surrounding you condense on your skin.
3) Condensation is a warming process.
4) So, you feel warm.

d) Condensation of vapour phase of H_2O: Humidity:

1) Some water vapor is always present in the air.
2) This vapor may come from evaporation of water from the surfaces of rivers, lakes, ponds and from the drying of wet clothes, sweat and so on.
3) The presence of vapour molecules in air is said to make the atmosphere humid.

Humidity (Definition): The amount of water vapor present in air is called humidity.

Dew:

1) In early morning, during winter, you might have noticed that water droplets form on window panes, flowers, grass etc.

Dew on the grass

How are these water droplets formed?
During winter nights, the atmospheric temperature goes down and the temperature of the window panes, flower, grass, etc, becomes colder. When the water molecules in air colloids these surfaces lose their temperature and condenses and forms these water droplets.

2) During winter nights, the atmospheric temperature goes down and the water vapor condenses and forms these water droplets.

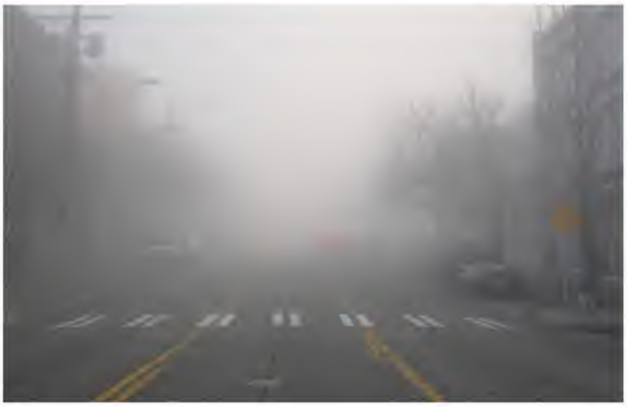
Dew (Definition): The water droplets condensed on surfaces are known as dew.

Fog:

1) In the region, where the temperature falls more the atmosphere contains a large amount of vapor and the condense on the dust particles in air and form small droplets of water.
2) These droplets keep floating in the air and form a thick mist, this tick mist is called fog.

Fog (Definition): The tick mist is called fog.

Does the temperature of the water rise continuously if heat is supplied to it continuously?
Yes, the temperature of the water rise up to 100°C and then there is no rise until the water completely changes to water vapor at 100°C.



Fog in the atmosphere

Boiling:

Activity on boiling of water:

1) Take a beaker of water, arrange a Laboratory thermometer in water and heat it with a burner.
2) Note the readings of thermometer for every two minutes.

Did you see any rise or fall in the level of the surface of the water, in the beaker? Why?
Yes, we see the fall in the level of water at first and then rise. Because first the beaker expands on heating. But this change in water level is very negligible.

Does the temperature rise continuously?
Yes, it rises up to 100°C.

When does the rise in temperature of water stop?
At 100°C.

3) The temperature of the water rises continuously, till it reaches 100° C.
4) At 100° C, though supply of heat continuous, the temperature does not increase further and a lot of bubbling at the surface of water appears.
5) This process is called boiling of water.
6) Boiling point of water is 100°C.

Why does this happen?
When liquids like water heated, solubility of gases inside the liquid decreases and came out by forming as bubbles. That looks like boiling.

Process of boiling of water:

1) Water is a solution, contains many impurities.
2) When water (or any liquid) is heated, the solubility of gases it contains reduces.
3) As a result, bubbles of gas are formed in water (or liquid).
4) Evaporation of water molecules from the surrounding causes these bubbles to become filled with saturated vapor.
5) As increase the temperature of the liquid by heating, the pressure inside the bubbles increases.
6) At a certain temperature, the pressure of the saturated vapor inside the bubbles becomes equal to the pressure exerted on the bubbles from the outside.
7) as a result, these bubbles rise rapidly to the surface and collapse at the surface releasing vapor into air at the surface.
8) This process continuous as long as supply heat.

Boiling (Definition):

"Boiling is a process in which the liquid phase changes to gaseous phase at a constant temperature at a given pressure."

Boiling point: The temperature at which boiling start is called Boiling point.

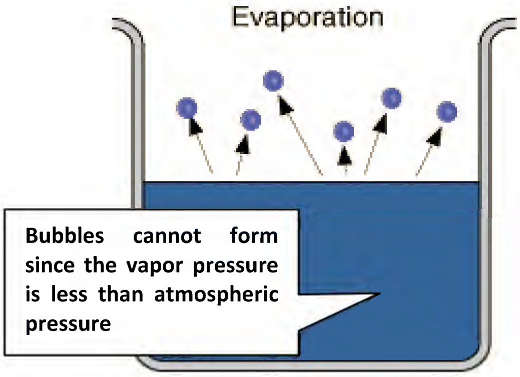
Note: The boiling point of water is 100^0C or 373 K.

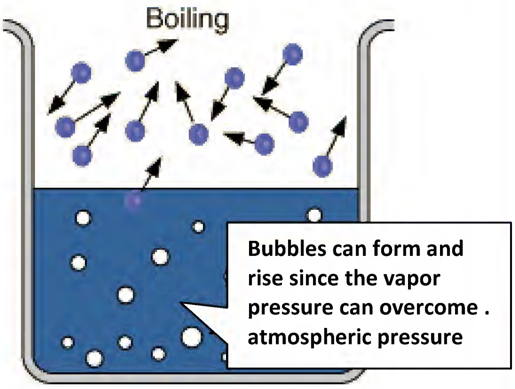
Are the processes of evaporation and boiling the same?
No.

Boiling of water

Differences between evaporation and boiling:

Evaporation	Boiling
1) "The process of escaping of molecules from the surface of a liquid at any temperature is called evaporation" (or) "The change of phase from liquid to gas that occurs at the surface of the liquid."	1) "Boiling is a process in which the liquid phase changes to gaseous phase at a constant temperature at a given pressure."
2) Evaporation takes place at any temperature.	2) Condensation takes place at a definite temperature.
3) This is surface phenomenon.	3) This is bulk phenomenon.
4) Evaporation depends on surface area, wind speed, humidity.	4) Condensation depends on atmospheric pressure.


Evaporation
Bubbles cannot form since the vapor pressure is less than atmospheric pressure


Boiling
Bubbles can form and rise since the vapor pressure can overcome . atmospheric pressure

Sample Questions to make to know the differences between evaporation and boiling:

1) Does evaporation take at any temperature?
2) Does boiling take at any temperature?
3) Does evaporation take only at definite temperature?
4) Does boiling take only at definite temperature?
5) Is evaporation surface phenomenon?
6) Is boiling surface phenomenon?
7) Is evaporation bulk phenomenon?
8) Is boiling bulk phenomenon?
9) On which factors evaporation depend?
10) On which factors boiling depend?

Where does the heat energy supplied go?
No.

Latent Heat of vaporization:

1. Heat energy is used to change the state of liquid to vapor (gas) is called Latent heat of vaporization.

Latent Heat of vaporization (Definition):

The heat energy required to change 1 gm of liquid to gas at constant temperature is called Latent heat of vaporization.

Explanation: Let a liquid of 'm' mass requires heat energy 'Q' calories to change from its state from liquid phase to gas phase,

Latent Heat of vaporization

$$L_v = \frac{Q}{m}$$

Units of Latent Heat:

In C.G.S system : **Cal/gm**
In S.I. system : **J/Kg**.

Note: The boiling point of water a constant atmospheric pressure (1 atm) is 100^0 C or 373 K

Latent heat of vaporization of water is 540cal/gm.

Why does an ice cube get converted into water?
Because when ice is heated the attraction between molecules decreases and converts as water.

Melting:

Activity on Melting:

1) Take some small ice cubes in a beaker and heat them by using a burner.
2) Arrange a thermometer to observe change in temperature.
3) At the beginning the temperature of ice is equal to or below 0^0C. If the temperature of ice is below 0^0C it goes on changing till it reaches 0^0C and then it began to convert as water.
4) This is called melting.

What changes do you notice in the reading of thermometer as time passes by?
The reading in thermometer changes up to 0^0C.

Does the temperature of the ice change during the process of melting?
No.

Why does this happen?
Because when ice is heated the attraction between molecules decreases by increase internal energy and converts as water.

Melting of Ice:

1) On heating the internal energy of the particles of the ice cubes increases.
2) These energy weakens the bonds of molecules as well as breaks the bonds and solid state ice converts as water.

Melting (Def): The process in which solid phase changes to liquid phase at a constant temperature is called 'melting'. This constant temperature is called as 'melting point'.

Melting point of Ice: Melting point of ice is **0^0C.**

Latent Heat of Fusion (Def): The heat energy required to convert 1 gm of solid completely into liquid at a constant temperature is called latent heat of fusion.

Let a solid of mass 'm' required heat energy 'Q' to change it from the solid phase to liquid phase.

Latent heat of fusion

$$L_f = \frac{Q}{m}$$

How much heat energy is required to convert 1gm of ice to liquid?
Equal to latent heat of fusion.

Units of Latent heat of fusion:

In C.G.S. system : **cal/gm.**
In S.I. system : **J/Kg.**

Latent heat of fusion of ice value:

80cal/gm.

Freezing (Def):

The process, when the temperature of the water decreases gradually, the internal energy of the water decreases and become ice or a solid is called freezing. (or) "The process in which a substance in liquid phase changes to solid phase by losing some of its energy is called freezing".

Freezing temperature of water: Freezing of water takes place at 0⁰C temperature and at 1 atm pressure.

Freezing of water in a glass

Reason for coconut oil and ghee getting converted from liquid to solid during winter:

1) During winter atmospheric temperature decreases.
2) As the temperature decreases, liquid coconut oil and ghee particles decreases their internal energy and convert to solid state.

What could be the reason for this change?
Due to decrease of their temperature.

How does it get converted from liquid phase to solid phase?
By decrease its internal energy.

Are the volumes of water and ice formed with same amount of water equal? Why?
No. Because the water expands (increases in volume) on freezing.

What happens to water kept in a refrigerator?
It converts into ice.

Relation between the volumes of water and ice (or) **Activity showing water expands (increases its volume) on Freezing:**

1) Take a small bottle with a tight lid and fill it with water completely without any gap.
2) Fix the lid tightly and put it into deep freezer of a refrigerator.
3) After few hours, we observe that the glass bottle breaks because the volume of the ice is greater than the volume of the water filled in the bottle.

Why did the glass bottle break?
Because the volume of ice increases when water converts into ice in of same volume.

4) So, water expands or increases in volume on freezing.

Reason for ice floats on water:

1) When the density of an object is less than to the water it floats on the water.
2) The density of ice is less than that of water. So, it floats on the water.

Lord Kelvin

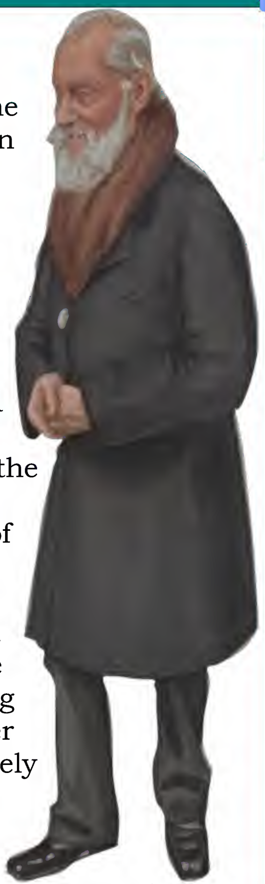
Lord Kelvin (William Thomson) was born on 26 Jun 1824 in College Square East, Belfast, Ireland. His mother died when he was six, and when aged eight, he moved with the family to Glasgow (1833) where his father, James Thomson, had been appointed as professor of mathematics at the University of Glasgow (1832).

He was an infant prodigy in mathematics, taught by his father until, by age 10, he entered the University of Glasgow in 1834. Guided by his father's interest in his education, Thomson studied at Cambridge University (1841-1845). He then did postgraduate work in Paris with Henri-Victor Regnault, including study of science demonstration techniques. Throughout his education, Thomson demonstrated excellence and published scholarly papers on mathematics, the first when he was.

When he became Professor of Natural Philosophy at Glasgow University in 1846, at age 22, he held the position for half a century. It was here he would create the first physics laboratory at a British University.

Also in 1846, he estimated the age of the earth-based on creation at the temperature of the sun and the rate of cooling for a body of the size of the earth—to be around 100 million years.

Kelvin’s other interests in heat, though, were productive and correct. He first defined the absolute temperature scale in 1848, subsequently named after him, which was the first scale based on a completely general natural law. In the same year, still in his early 20’s, he was made a member of the Royal Society.
In 1851 he published ideas leading to the second law of thermodynamics and supported his friend James Joule’s mechanical equivalent of heat. He changed the view of heat as being a fluid to an understanding of the energy of motion of molecules. The term “kinetic energy” was coined by Thomson in 1856. The names of these two scientists are linked with the famous Joule-Kelvin Effect (1852) which makes refrigerators work. Kelvin's name is also immortalized by the Kelvinator fridge.



While at Cambridge, Thomson had published 'The Uniform Motion of Heat in Homogeneous Solid Bodies, And its Connection with the Mathematical Theory of Electricity,'. By applying this analogy of heat flow to the flow of electricity, in 1854, he joined Cyrus Field’s efforts to lay a transatlantic telegraph line. He improved the design of the cables, even traveled on the ships supervising the laying of them.

This experience prompted Kelvin’s invention of the mirror galvanometer as a long distance telegraph receiver which could detect extremely feeble signals. He studied the electrical losses in cables, and improved the mariner's work with the invention of an improved gyro-compass, new sounding equipment, and a tide prediction with chart-recording machine. He also introduced Bell’s telephone into Britain.

He stayed with the Transatlantic cable project Despite problems, setbacks and the need to restart more than once. With the breadth experience acquired, he now became wealthy from consulting on the subsequent submarine cable projects of others.

Thomson published more than 600 scientific papers and filed a total of 70 patents. He was the president of the Royal Society from 1890 to 1895.

In 1866 he was knighted because of his achievements in submarine cable laying. In 1892 he was raised to the peerage as Baron Kelvin of Largs, which title he chose from the Kelvin River, near Glasgow. He was Britain's first scientific peer.

When he died in 1907, he was buried next to Isaac Newton in Westminster Abbey.

Source: www.en.wikipedia.org/Lord_kelvin

CROSS WORD

*	1						2					
*	*	*	*	*	*	*		*	*	*	*	*
3		4										
	*		*	*	5	*		*	*	*	*	*
	*		*	*		*		*	*	6	*	7
	*	8							*		*	*
	9			*		*		*	*	10		
		*	*	*		*	11				*	12
*		*	13	*		*		*	14		*	
*		*	*	15		*		*	*	*	*	
16											*	
*		*	*	17							*	
*	18						*	*	*	*	*	

Rows:

1. The phase change from gas to liquid. (12)
3. The average.....of the molecules is directly proportional to the absolute temperature. (13)
7. msΔT (1)
8. The C.G.S. unit of heat.(7)
9. Thick mist. (reversed) (3)
10. Solid state of water...reversed.(3)
11. ....is the energy that flows.(4)
16. Determines direction of heat flow.(11)
17. Evaporation is..... process. (7)
18. Heat energy required to convert 1gm of solid completely into liquid at a constant temperature is latent heat of... (6)

Coloums:

2. Samosa cool outside, hot inside the reason...(use only one 'c') (11)
4. This behave like store house.(reversed) (5)
3. Temperature unit.(6)
5. The reverse process of evaporation. (7)
6. When we heat water above 100^{0}C, then we get... (reversed)(5)
9. Letter 'R' missed in the process of liquid phase changes to solid phase.(reversed) (7)
12. the heat required to change 1gm of liquid to vapour is ......heat of vaporization.(reversed) (6)
13. 1 cal = 4.186.... (1)
14. Q/m (1)
15. The water droplets condensed on flower, grass. (3)

PROJECT

Name of the project: Collect the information about working of natural geyser and prepare a report.

Objective: To know the causes to form hot geysers, the places at which hot geysers located in India, the information about hot geysers.

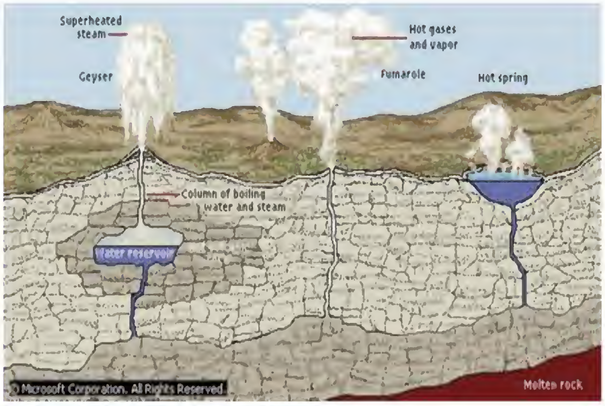
Type of project: collecting information

Method of study: Collect the information from internet and various news papers.

Data collection: Natural geysers are hot springs that intermittently throw up a jet of hot water, stream, etc. The earth's crust has cracks and vents. Water occupies these and gets heated due to geothermal energy.

Due to heating, water turns into steam and pressure increases. In this case, if the opening of the vent/ crack is narrow, it erupts like a volcano; otherwise it flows like a stream. The "Old Faithful" geyser at Yellowstone National Park in the US is one of the most famous.

Some geysers are located in **Haryana, Himachal Pradesh, west Bengal** states in **India.**



The geothermal energy and expansion of vapour at low pressures and high temperatures causes the geysers. The formation of geysers is a hydro-geological phenomenon under certain conditions. They are nearby volcanoes and due to the presence of magma. The small holes in Earth are called "surface vents". There are fractures, fissures, porous spaces, cavities in side Earth's crust. There is water available inside Earth up to the depth of about 10 km. The rocks are very very hot there. This system of water reservoir holding water, getting heated and coming out through the vents is called a plumbing system. Along these vents SiO2 or geyserites is deposited and makes the vents smooth and hard. They enable high pressure to be maintained along the vents.

After certain duration, the pressure of water inside Earth comes down, so geysers stop. The water on the surface seeps through pores in Earth and this slowly collects back into the reservoirs of the geysers. Thus the geyser cycle again starts.

They exist in about 1000-1500 places on Earth. There are a lot of them in the USA, especially at Yellowstone National Park at Wyoming. The Grand geyser in USA erupts for about 10 minutes every 12 hours. There is a valley of Geysers in Russia in Kamchatka peninsula. This is the major one in Euro-Asia. In India there are some including one famous one in Hariyana.

There are around 80 in El Tatio, Chile. There are some in Taup Volcanic zone in (North Island of) New Zealand. It is supposed to have reached 160 meters high. In Iceland too there are famous geysers including the Great Geyser.

Chumatang Geyser

White Rice Preparation in Manikaran geyser

Tapovan geyser

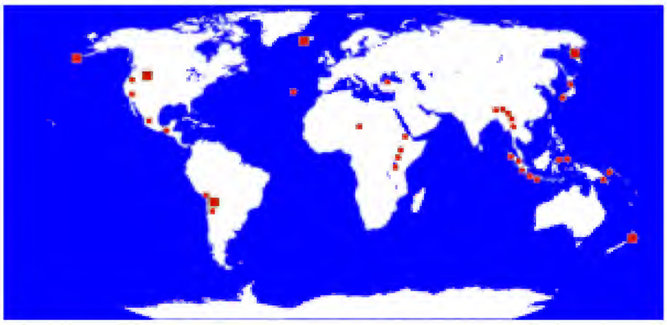
Rajgiri geyser in Bihar

Thapakund geyser in Bhadrinath

Some geysers in India

S. No	Place	State	Speciality
1	Sohna	Haryana	
2	Vasistha Bharath	Himachal Pradesh	Caused by sulphur gases
3	Manikaran	Himachal Pradesh	Water has no odour. The Indian faith that this water will be cure the bone diseases when we bath.
4	Bhadrinath	Himachal Pradesh	
7	Ganganani	Himachal Pradesh	The water has basic property
8	Garam pani	Assam	
9	Usap dev Posap dev	Maharastra	
10	Chumathang	Ladakh area	
11	Chaval pani	Madhya Pradesh	We will prepare white rice while we insert the rice in this water.
12	Bakareswar	West Bengal	

There are many hat geysers in Sikkim. The geysers in Sikkim have Sulphur gases. So these are known as “Sulphatara Geysers”. The average temperature in these geysers is 50^{0}C. The water vapour in geysers contains Sulphur gases are called “Sulphatara geysers”.



FAMOUS GEYSERS IN THE WORLD

CONCLUSION:

Natural geysers are hot springs that intermittently throw up a jet of hot water, stream, etc. The geothermal energy and expansion of vapour at low pressures and high temperatures causes the geysers.

Sources:

1. News papers,
2. Internet
3. Physical Science text books and magazines.

Project Report

Name of the project: Collect the information about working of natural geyser and prepare a report.
Class : 10th
Subject: Physical Science
School:
Time taken for the project: 5 days
Apparatus/references: Internet, news papers, magazines etc.,

Details of the project:

We collect information about natural geysers and formation of geysers in various science magazines and internet. we prepared this project by discussing with our team members and teachers.

Observations:

1) We have learnt the causes of formation of natural geysers.
2) We have collected data of various geysers in india.

Project outcome:

Natural geysers are hot springs that intermittently throw up a jet of hot water, stream, etc. The geothermal energy and expansion of vapour at low pressures and high temperatures causes the geysers.

Names of the group members and work division:

S. No.	Name of the member	Work allotted
1		
2		
3		
4		
5		

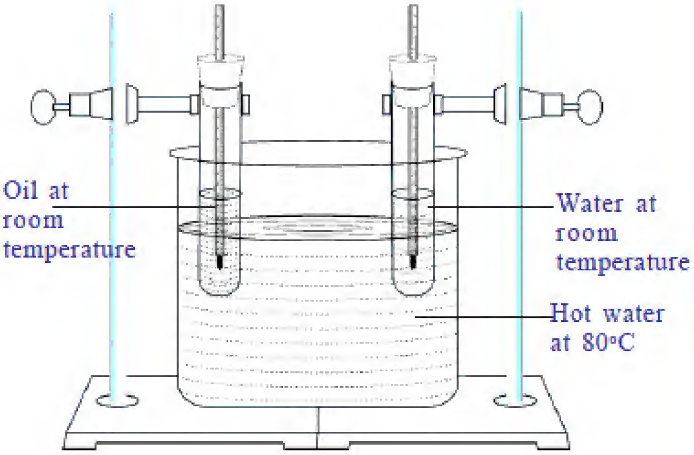
Date of submission: Signatures

Figure of the month

In this we give you an important figure question in the covered syllabus. We request you to practice the figure and the question given under this topic.

Question:
Which apparatus you use to prove that the rate of rise in temperature depends on the nature of the substance? Draw the experimental setup for that.

Answer:
Apparatus you use to prove that the rate of rise in temperature depends on the nature of the substance:
1. Large Jar, 2. Two Identical Boiling Test Tubes, 3. Single-Holed Corks, 4. Two Thermometers, 5. Retort Stands.



> “Imagination is more important than knowledge”
> - Albert Einstein

C.C.E.BITS

Hi Students, Here are some important CCE model Bits given for you from the covered syllabus of this issue. We request you to practice these bits and also some more to get full marks in bits.

1) 0°C =………. K (Kelvin) ( )
A) 273 B) 0
C) 100 D) 373

2) Units of specific heat is…… ( )
A) $\frac{Cal-g}{.^0C}$ B) $\frac{Cal}{g\,.^0C}$
C) $Cal-g-\ {}^0C$ D) $\frac{Cal-.^0C}{g}$

3) Boiling point of water at normal atmospheric pressure is…… ( )
A) 0^0C B) 100^0C
C) 110^0C D) 120^0C

4) When two bodies are placed in thermal contact then ( )
P. Heat energy will be transferred until both bodies attain same temperature
Q. Heat energy will be transferred until both bodies attain thermal equilibrium.
R. Heat energy will be transferred until both bodies attain same degree of hotness or coldness
S. Heat energy will be transferred until both bodies attain same internal energy.
A) P and Q are true
B) Q and R are true
C) P, Q and R are true
D) All statements are true.

5) When ice melts, its temperature… ( )
A) Increases B) Decreases
C) Remains same D) Increase or decrease

6) Matching. ( )

1. Latent heat of fusion ice.	( )	P) 373 K
2. Latent heat of Vaporization.	( )	Q) 80 cal
3. Boiling point of water at STP.	( )	R) 540 cal

A) 1-R,2-P,3-Q B) 1-Q,2-P,3-R
C) 1-Q,2-R,3-P D) 1-P,2-Q,3-R

7) The difference in temperature of a body measured as 27°C. Its corresponding difference in Kelvin scale ( )
A) 300K B) OK
C) -154K D) 27K

8) Object X is at 32^0 C and "Y" at 32 K when they are in thermal contact the direction of heat flow. ( )
A) Y to X B) X to Y
C) X to X D) Y to Y

9) Match the following. ( )

(i) Amount of water vapour present in air	( )	P) Fog
(ii) Condensation of water droplets on grass	( )	Q) Humidity
(iii) Condensation of water droplets on dust	( )	R) Humidity Particles in air

A) i-P, ii-Q, ii-R B) i-Q, ii-R, ii-P
C) i-R, ii-P, ii-Q D) i-R, ii-Q, ii-P

10) ………. is a process in which the liquid phase changes to gaseous phase at a constant temperature at a given pressure. ( )
A) Evaporation B) Condensation
C) Boiling D) Melting.

11) A thermometer showed a patient's body temperature as 38^0 C. Its value in Kelvin scale is ( )
A) 235 K B) 311 K
C) 273 K D) 275 K

12) The latent heat of vaporisation of water is ( )
A) 80 cal/gm B) 80 k.cal/gm
C) 540 cal/gm D) 540 k.cal/gm

13) Statement P: During evaporation, the temperature of evaporating liquid decreases.
Statement Q: During condensation; the temperature of air in surrounding area increases. ( )
A) P and Q are true.
B) P is true and Q is False
C)P is False and Q is true
D)Both P and Q are False

14. The temperature of a body is 400 K, Its temperature ^{0}C is………….. ( )
A) 673^0C B) 27^0C
C) 173^0C D) 127^0C

* * *

> "Be less curious about people and more curious about ideas "
>
> \- Marie curie

LAB ACTIVITY

FACTORS AFFECT THE RATE OF EVAPORATION OF WATER

Aim : To prove the factors affect the rate of evaporation.

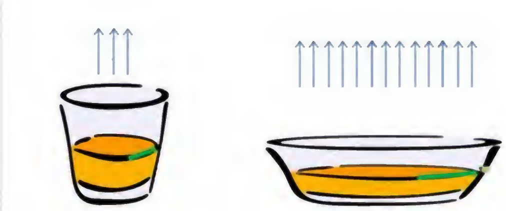
Material required:

- 5 plates that can hold 100ml water,
- 1 glass that can hold 100ml water (the area of the mouth of the glass must be at least 3 times smaller than the plate)
- 600 ml water
- 1 fan

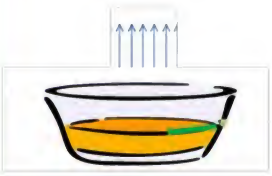
Evaporaton : Evaporation is the process by which liquid spontaneously turns into gas. In the case of water, it turns into water vapor.

Proceedure:

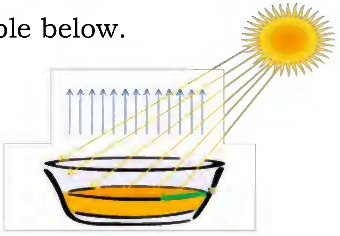
1) For this experiment, the independent variables are the water- surface area, temperature and air pressure. The dependent variable is the rate of water evaporation. The constants (control variables) are the amount of water used in each experiment.
2) The glass and one of the plates are filled with 100ml of water each. The water in the plate will have a larger surface area than the water in the glass. The rate of evaporation is observed every 10 minutes. The results are recorded in the table below.



3) Two of the plates are filled with 100ml of water each. One of the plates is placed indoors where the temperature is cooler and the other plate is placed directly under the sun where the temperature is higher. The rate evaporation of the water is observed every 10 minutes. The results are recorded in the table below.



Indoor
(cooler temperature)



Outdoor
(higher temperature)

4) The last two plates are filled with 100ml of water each. One of the plates is placed directly in the path of the wind from the fan and the other plate is placed away from the fan. The wind from the fan will reduce the air pressure around the first plate. The rate of evaporation of the water is observed every 10 minutes. The results are recorded in the table below.

Path of the wind
from a fan

away from
the fan

Observation

The results show that the plate with the larger space area, the plate placed under the sun and the plate placed under the fan had the water evaporating faster.

specimen	Environment	result
Glass of water	Small surface area	
Plate of water	Larger surface area	✔
Plate of water indoors	Lower temperature	
Plate of water under the sun	Higher temperature	✔
Plate of water away from the fan	Higher air pressure	
Plate of water under the fan	Lower air pressure	✔

✔ - indicates a faster rate of evaporation

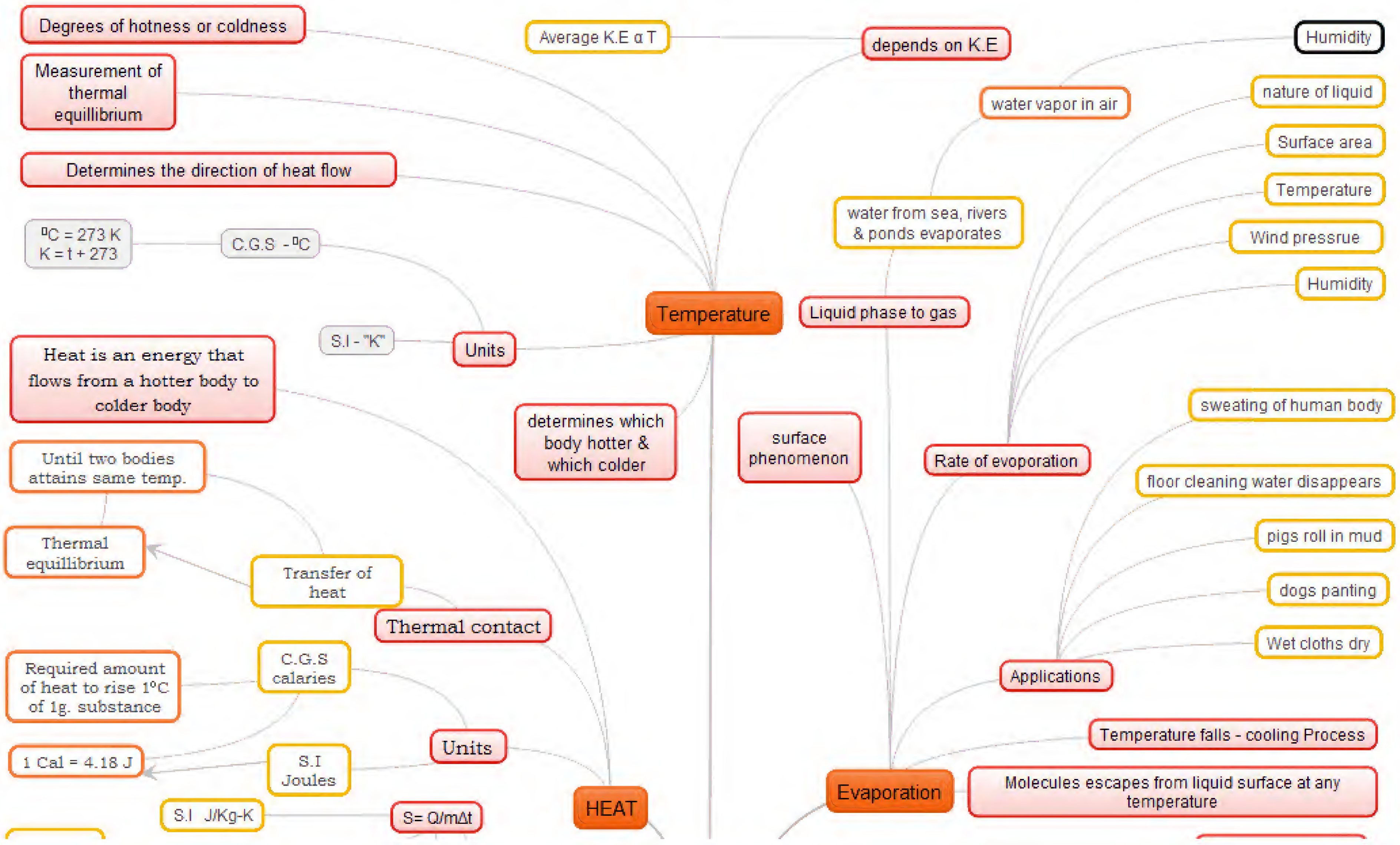
Result:

The rate of evaporation of water will be faster with a larger surface area, higher temperature or lower air pressure environment, is proven to be true.

Precautions :

1. Observe the levels of water in the plates carefully.
2. Take same quantity and temperature of water at the beginning of the each experiment.

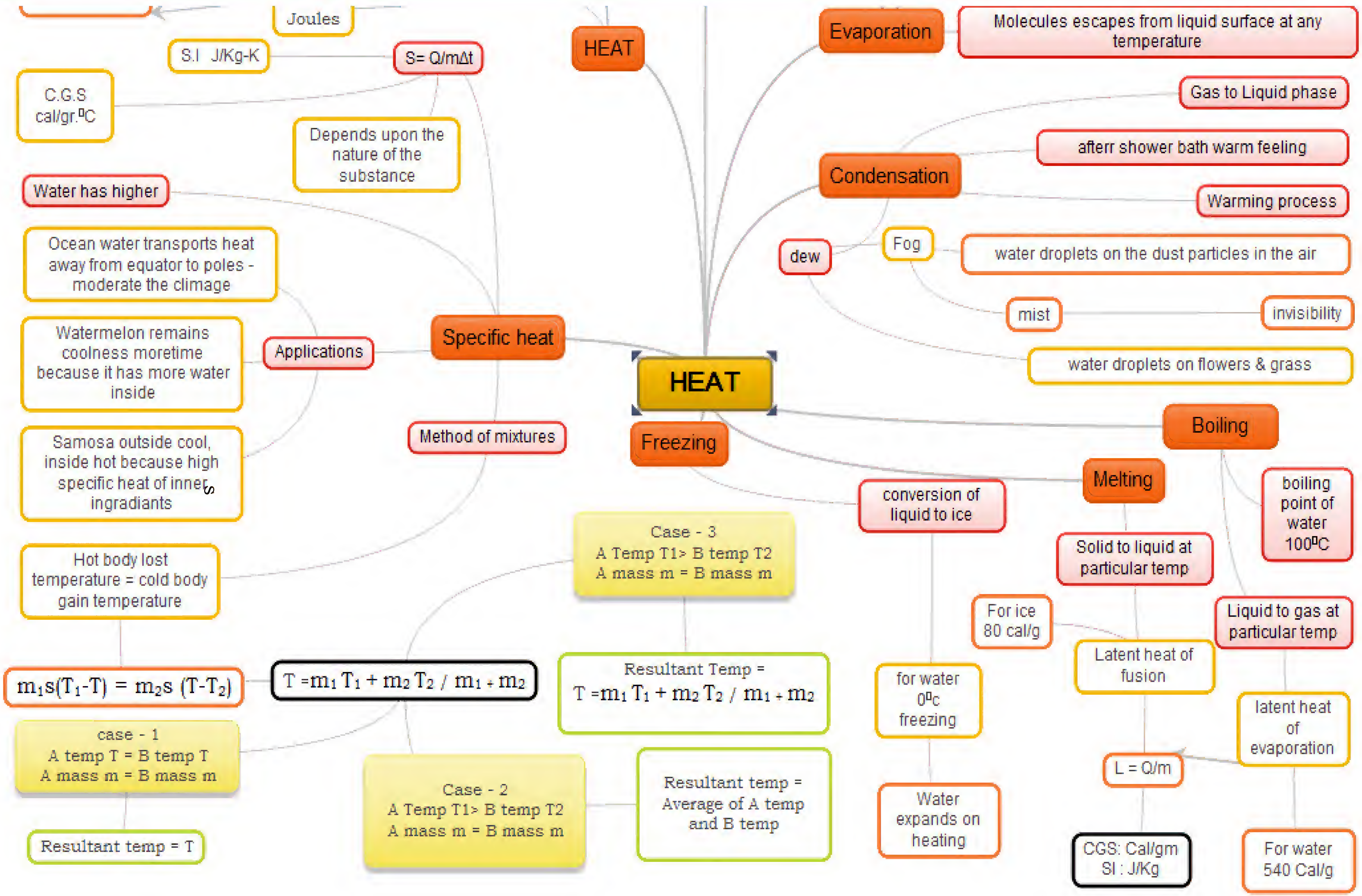
Mind Mapping - Heat



Temperature
- Degrees of hotness or coldness
- Measurement of thermal equillibrium
- Determines the direction of heat flow
- depends on K.E
  - Average K.E α T
- Units
  - C.G.S - ⁰C
    - ⁰C = 273 K
    - K = t + 273
  - S.I - "K"
- determines which body hotter & which colder

HEAT
- Heat is an energy that flows from a hotter body to colder body
- Thermal contact
  - Transfer of heat
    - Thermal equillibrium
      - Until two bodies attains same temp.
- Units
  - C.G.S calaries
    - Required amount of heat to rise 1°C of 1g. substance
    - 1 Cal = 4.18 J
  - S.I Joules
- S= Q/mΔt
  - S.I J/Kg-K

Evaporation
- Liquid phase to gas
  - water from sea, rivers & ponds evaporates
    - water vapor in air
      - Humidity
- surface phenomenon
- Rate of evoporation
  - nature of liquid
  - Surface area
  - Temperature
  - Wind pressrue
  - Humidity
- Applications
  - sweating of human body
  - floor cleaning water disappears
  - pigs roll in mud
  - dogs panting
  - Wet cloths dry
- Temperature falls - cooling Process
- Molecules escapes from liquid surface at any temperature


HEAT
HEAT
Evaporation
Molecules escapes from liquid surface at any temperature
Condensation
Gas to Liquid phase
afterr shower bath warm feeling
Warming process
dew
Fog
water droplets on the dust particles in the air
mist
invisibility
water droplets on flowers & grass
Boiling
boiling point of water 100⁰C
Liquid to gas at particular temp
latent heat of evaporation
For water 540 Cal/g
Melting
Solid to liquid at particular temp
Latent heat of fusion
For ice 80 cal/g
L = Q/m
CGS: Cal/gm
SI : J/Kg
Freezing
conversion of liquid to ice
for water 0⁰c freezing
Water expands on heating
Specific heat
S= Q/mΔt
S.I J/Kg-K
Joules
C.G.S cal/gr.⁰C
Depends upon the nature of the substance
Water has higher
Applications
Ocean water transports heat away from equator to poles - moderate the climage
Watermelon remains coolness moretime because it has more water inside
Samosa outside cool, inside hot because high specific heat of inners ingradiants
Method of mixtures
Hot body lost temperature = cold body gain temperature
m₁s(T₁-T) = m₂s (T-T₂)
case - 1
A temp T = B temp T
A mass m = B mass m
Resultant temp = T
Case - 2
A Temp T1> B temp T2
A mass m = B mass m
Resultant temp = Average of A temp and B temp
Case - 3
A Temp T1> B temp T2
A mass m = B mass m
Resultant Temp =
T =m₁ T₁ + m₂ T₂ / m₁ + m₂
T =m₁ T₁ + m₂ T₂ / m₁ + m₂

PRINT THE PAGES 30 AND 31 AND STICK THEM CAREFULLY TO GET MING MAPPING

MADE EASY CONCEPT

How to solve a physical science problem in an easy way

Generally students have a fear to solve physical science problems. To overcome this we introduce a simple step by step method called as **"QUF S&S" Method.**

Let us explain this in detail. In **"QUF S&S" Method**, **'Q'** refers **Quantities; 'U'** refers **Units; 'F'** refers **Formula** and **S&S** refers **Substitute and Solve**.

Explanation with one Example: What would be the final temperature of a mixture of 50g of water at 20^{o}C temperature and 50g of water at 40^{o}C temperature?

(Text Book Page No: 17, Q.No:1)

Step-1 (**Q**uantities)	In this we have to write the given quantities in the problem and write the quantity which we have to find out and put a question mark.	Here m_1= 50g, T_1= 20^{o}C m_2= 50g, T_2= 40^{o}C The final temperature (T) =?
Step-2 (**U**nits)	In this we have to check, whether all given quantities are in the same system of units or not. If they are in different system of units, we must be change all in one system of units otherwise leave this step.	(All in the CGS system. So, no need to change the system of units.)
Step-3 (**F**ormula)	In this we have to write a formula related to the given quantities and required to find out quantity.	Formula: $T = \frac{m_1T_1+m_2T_2}{m_1+m_2}$
Step-4 (**S**ubstitute and **S**olve):	In this we substitute all values in the formula and solve to find the required value. Here we must write the answer with relevant units. Also write the final answer in a box.	$= \frac{50X20 +50X40}{50 +50}$ $= \frac{1000+2000}{100} = 30^{o}C$ The final temperature of the mixture = 30^{o}C = 303 K

> "One best book is equal to hundred good friends
> But one good friend is equal to a library "
> \- Dr.A.P.J.Abdul Kalam

DIY PROJECT/EXPERIMENT

DIY means **Do It Yourself**. In this we give a very small and easy project or experiment, which can the students do easy at their home with materials available at home. Students in this issue we give an experiment to observe the relation between Kinetic Energy and Temperature.

Do this experiment and enjoy the learning.

Aim: To observe the relation between Kinetic Energy and Temperature.

Materials Required: Three glass tumblers, Small white paper, Marker pen, Food colour, Hot water, water at room temperature, Cold water.

Procedure: Take three glass tumblers. Paste a small white paper slip to each of them and label the first glass tumbler as A, second glass tumbler as B and third glass tumbler as C with a marker pen. Now take some water in a bowl, heat it for some time and pour some hot water in the glass tumbler A. Pour some water in the glass tumbler B, which is at room temperature. Collect cold water from the fridge and pour it into the glass tumbler C.

Sprinkle food colour on the surface of water in three glass tumblers A, B and C.

We know the molecules of water in three glass tumblers are in random motion. So, you observe the motion of small grains of food colour in A, B and C. You observe the grains of food colour move randomly.

Observation: The random motion of the grains of food colour in the hot water glass tumbler A is more, in glass tumbler B is moderate and in the cold water glass tumbler C is less.

Because of the speed of motion of molecules in the glass tumblers of water is different, they have different Kinetic Energies.

Conclusion: The average Kinetic Energy of the molecules of a hotter body (hot water) is greater than that of a colder body (cold water).

Learning outcome: The average Kinetic Energy of the molecule is directly proportional to the absolute temperature.

Hot

Room Temperature

Cold

> "What we know is a drop, What we don't know is an ocean. "
>
> \- Isaac Newton

C.C.E QUESTIONS

1) Suggest an experiment to show that when ice is converted into water, its temperature does not change. How much heat is required to convert 5 grams of ice at0^0C to water, at the same temperature? (Latent heat of fusion of ice is 80cal/gm)

(TS June 2015 Supplementary)

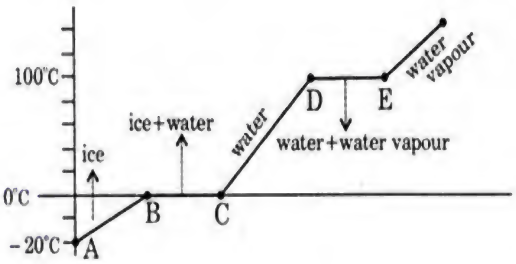
2) While drinking water, Rama spilled some water on the floor. After sometime, the water disappeared from the floor. What happened to the water? (TS June 2015 Supplementary)

3) Give an example to explain that evaporation is a cooling process. (TS March 2016)

4) Why water drops (dew) form on flowers and grass during morning hours in winter season? (TS March 2016)

5) Write the factors that affect the process of evaporation. Explain with suitable examples. (AP March 2017)

6) The graph shows the values of temperature, when ice is heated till it becomes water vapour. Observe the graph and answer the following questions.(Note that the figure is not completely quantitative and also not to the scale. It is purely qualitative)



a) At what temperature, ice converts into water?

b) What does $\overline{DE}$ represent?

c) What is the range of temperature of liquid water?

d) Which part of the graph represents change of state from ice to water?

(TS March 2016)

7) What role does specific heat play in keeping a watermelon cool for a long time after removing it from a fridge on hot day? Explain. (AP June 2016 Supplementary)

8) What happens to the water when wet clothes dry? (AP March 2016)

9) Answer these: (AP March 2016)

a) How much energy is transferred when 1gm of boiling water at 100^0Ccondenses to water at 100^0C?

b) How much energy is transferred when 1gm of boiling water at 100^0C cools to water at 0^0C?

c) How much energy is released or absorbed when 1 gm of water at 0^0C Freezes to ice at 0^0C?

d) How much energy is released or absorbed when 1 gm of steam at 100^0C turns to ice at 0^0C?

10) Explain, why dogs pant during hot summer days using the concept of evaporation? (AP March 2015)

> "We cannot teach people anything. We can only help them discover it within themselves."
>
> \- Galileo Galilee

SEE IT... DO IT...

Easy way to solve 6th problem given in the text book in the Chapter: HEAT.

You can easily solve this problem by observing the given picture. This picture gives you clear cut concept about the problem. So, you see it, understand it and do the problem.

Problem (Page No: 18-6):

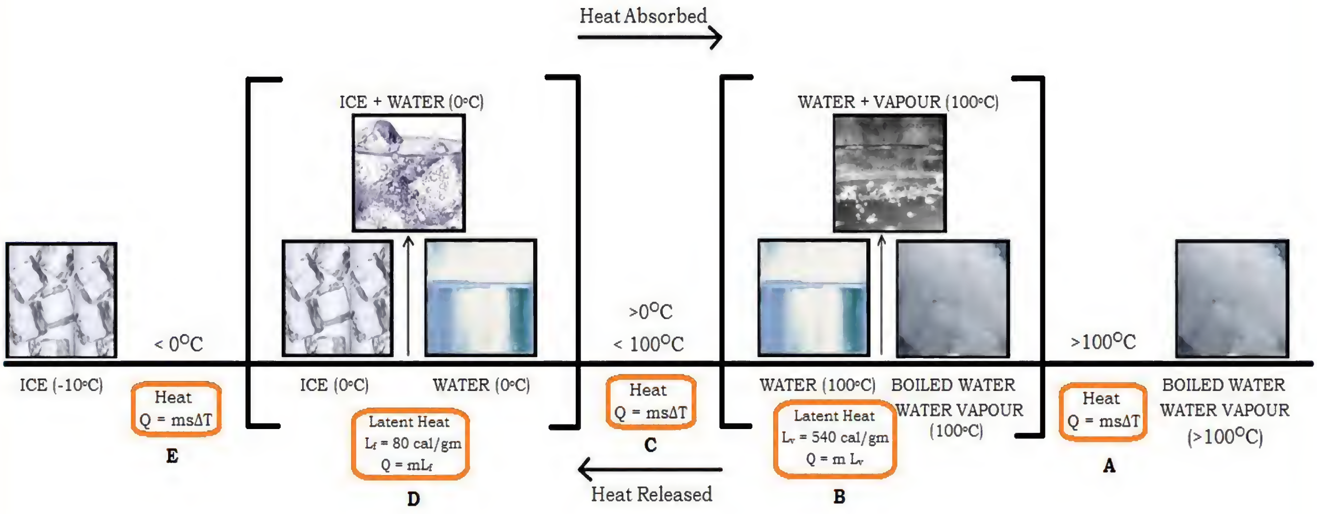
Answer these. (AS1)

a) How much energy is transferred when 1gm of boiling water at 100 °C condenses to water at100°C?

b) How much energy is transferred when 1gm of boiling water at 100°C cools to water at 0°C?

c) How much energy is released or absorbed when 1gm of water at 0°C freezes to ice at 0°C?

d) How much energy is released or absorbed when 1gm of steam at 100°C turns to ice at 0°C?



First you understand the picture.

E: Suppose we take ice at -10°C and heat it, up to 0°C there is an increase in the temperature. If we want to find out the required heat between ice (-10°C) to ice (0°C), we have to use **$Q = ms\Delta T$**.

D: At 0°C ice start melting. So, before start ice melt it has the temperature 0°C. On continue heating ice gradually converts into water. In this time of conversion there is no rise in temperature until the ice fully converted into water. The given temperature utilized in breaking the bonds between water molecules. After that we observe there is a rise in the temperature from 0°C. Here, also before rising the temperature water has 0°C. If we want to find out the required heat between ice (0°C) to water (0°C), we have to use latent heat concept,

$Q = mL_f$ ($L_f = 80$ *cal/gm*).

C: On continuous heating, the temperature rises up to 100°C. If we want to find out the required heat between water (0°C) to water (100°C), we have to use

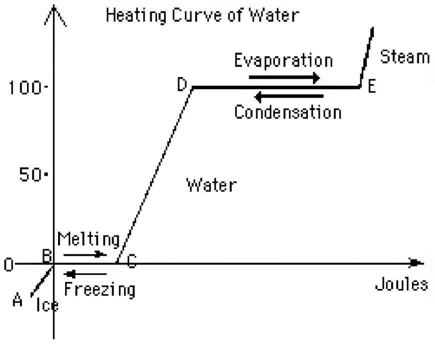
$Q = ms\Delta T$.

B: On continuous heating, the temperature of100°C water doesn't changes until it completely converts into water vapour/boiled water at 100°C. The given temperature utilized to convert water molecules into water vapour molecules. If we want to find out the required heat between water (100°C) to water vapour (100°C), we have to use latent heat concept,

$Q = mL_v$ ($L_v = 540$ *cal/gm*).

A: On continuous heating, the temperature rises from 100°C. If we want to find out the required heat between water vapour (100°C) to water vapour at ant temperature, we have to use **$Q = ms\Delta T$**.

Graphical Explanation:



A: Ice at < $0^{o}C$, only ice state.

Between A-B: only ice state, between < $0^{o}C$ to $0^{o}C$.

B: Start melting, only ice state, $0^{o}C$.

Between B-C: Continue melting, Ice with water state, $0^{o}C$.

C: Complete melting, only water state, $0^{o}C$.

Between C-D: Only water state, between $0^{o}C$ to $100^{o}C$.

D: Start boiling, only water state, $100^{o}C$.

Between D-E: Continue boiling, water with water vapour state, $100^{o}C$.

E: Complete boiling; only water vapour state, $100^{o}C$.

Above E: only water vapour, >$100^{o}C$.

Let us solve the problem by see it and do it and apply QUF S&S Method:

1. This is under **B**, m = 1gm, L_v = 540cal/gm, Q =?

Q = m L_v = 1 x 540 = 540 cal.

The transferred energy = 540 cal.

2. This is under **B** & **C**,

Under **B:** (Q_1) m = 1gm, L_v = 540cal/gm, Q_1 =?

Q_1 = m L_v = 1 x 540 = 540 cal.

Under **C:** (Q_2) m = 1gm, s = Specific Heat of water = 1 cal/gm-^{o}C

ΔT = Difference in temperature = 100 – 0 = 100 ^{o}C, Q_2 =?

Q_2 = msΔT = 1 x 1 x 100 = 100 cal.

Total energy transferred = Q_1 + Q_2 = 540 + 100 = 640 cal.

The transferred energy = 640 cal.

3. This is under **D,** m = 1gm, L_f = 80cal/gm, Q =?

Q = m L_v = 1 x 80 = 80 cal.

The released energy = 80 cal.

4. This is under **B, C & D,**

Under **B:** (Q_1) m = 1gm, L_v = 540cal/gm, Q_1 =?

Q_1 = m L_v = 1 x 540 = 540 cal.

Under **C:** (Q_2) m = 1gm, s = Specific Heat of water = 1 cal/gm-^{o}C

ΔT = Difference in temperature = 100 – 0 = 100 ^{o}C, Q_2 =?

Q_2 = msΔT = 1 x 1 x 100 = 100 cal.

Under **D:** (Q_3) m = 1gm, L_f = 80cal/gm, Q_3 =?

Q_3= m L_v = 1 x 80 = 80 cal.

Total energy transferred = Q_1 + Q_2 + Q_3 = 540 + 100 + 80 = 720 cal.

The released energy = 640 cal.

Latest Science News

Water signature found in Neptune-sized planet's atmosphere

Combining observations from NASA's Hubble and Spitzer space telescopes, researchers have detected strong water signature in the atmosphere of a distant Neptune-sized planet.

The distant planet HAT-P-26b has a primitive atmosphere composed almost entirely of hydrogen and helium, said the study published in the journal Science.

Located about 437 light years away, HAT-P-26b orbits a star roughly twice as old as the Sun.

Isro gearing up for maiden launch of its heaviest rocket in June

Buoyed by the successful launch of the South Asia Satellite, the Indian space agency is now busy preparing for the maiden launch of its heaviest rocket -- the 640-tonne Geosynchronous Satellite Launch Vehicle-Mark III (GSLV Mk III).

The notable aspect of this rocket is that the main and bigger cryogenic engine has been developed by space scientists here and will be powering the rocket for the first time.

Exhibition on wheels: Science Express to cover around 70 stations across India

The Science Express Climate Action Special (SECAS II), an innovative mobile science exhibition on a 16-coach AC train, will stop at 68 stations across the country in its current phase tour till September.

"The Science Express 9th Phase is covering around 70 stations for science popularisation in nearby areas," the Secretary Department of Science and Technology, Prof Ashutosh Sharma told PTI at a recent DST programme.

Schedule in Andhra Pradesh & Telangana

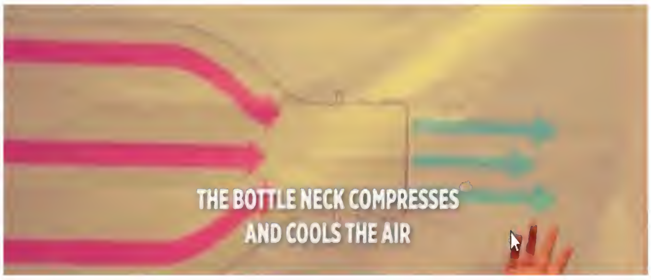
No	Station	Exhibition Dates
35	Kottavalasa	20 - 23 May 2017
36	Gudivada	24 - 26 May 2017
37	Miryalaguda	27 - 30 May 2017

HOME MADE EXPERIMENT

ECO COOLER

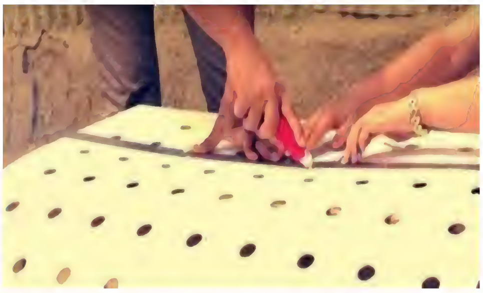
Eco-Cooler - world's first zero-electricity air cooler made from plastic bottles

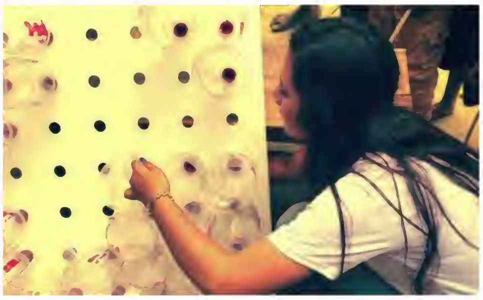
An Eco Cooler made out of discarded coke PET bottles has changed the way people of Daulatdia, a village in Rajbari district of Bangladesh, used to spend their summers. A simple idea with a little bit of science has helped Grameen Intel developed this cooler that works without electricity and doesn't cost a dime. Cut up the bottles from the bottom and set them up in a piece of cardboard, and voilà, your Eco cooler is ready! The bottle neck works as a compressor for hot air and cools it down. You may think it's too good to true, but many villages in Bangladesh are adopting it get some respite from the scorching heat. Here's the video from Grameen Intel on their wonderful initiative.



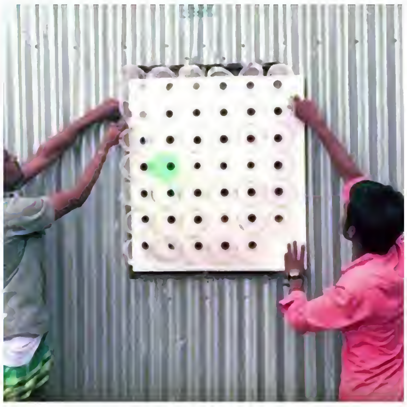
Most homes in Rural Bangladesh are made out of tin huts that go over 45°C during the summer

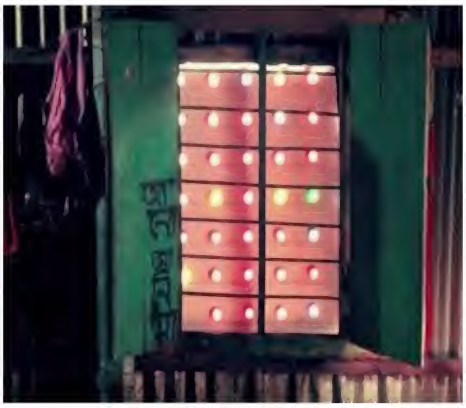
Re-purposing used soft drink and water bottles, The Eco-Cooler works without electricity to reduce temperatures up to 5° C.





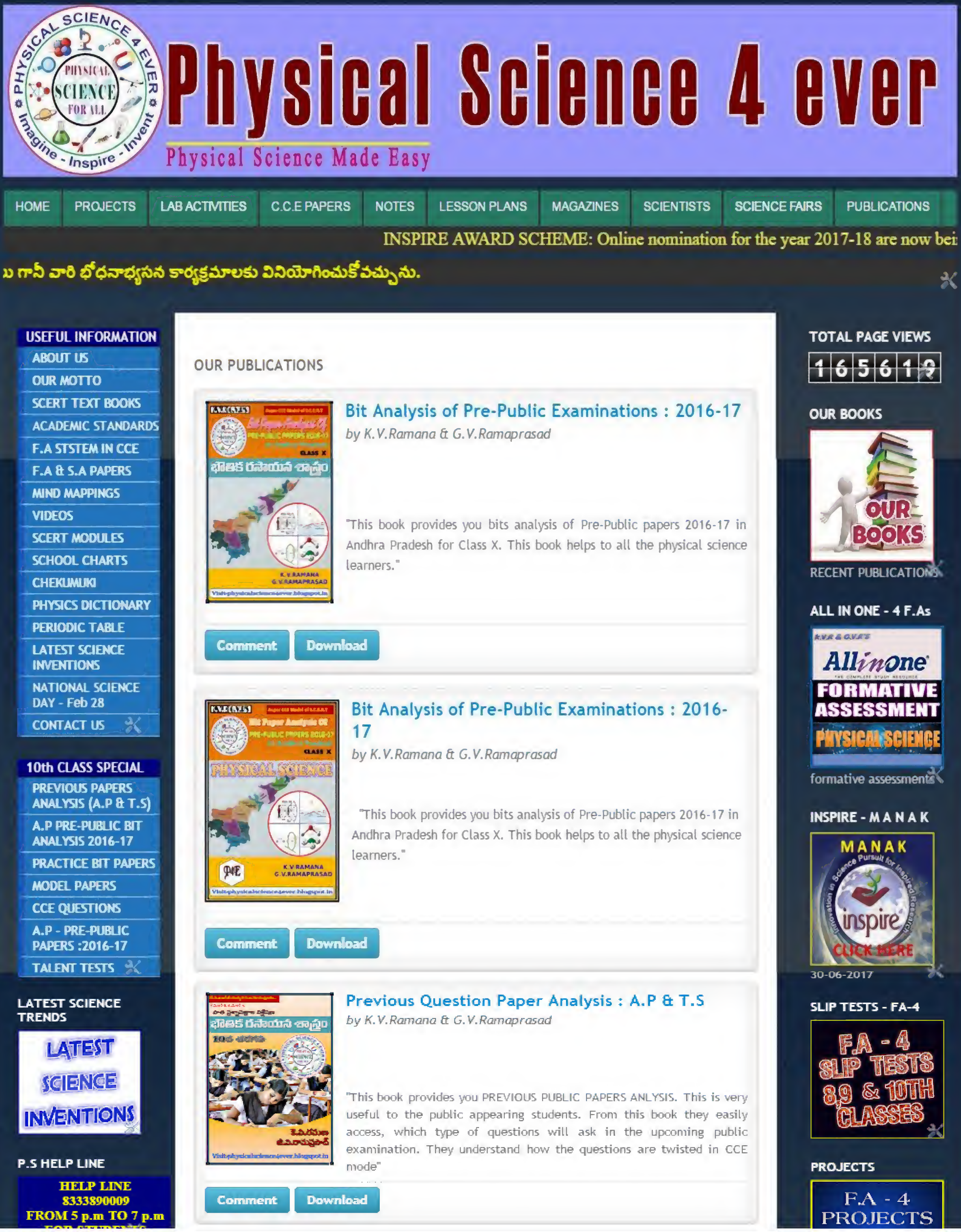
Cut the holes to the cardboard with each diameter is equal to the neck of the water bottle. Cut the bottles and arrange the necks of the bottles in the holes. And tighten them.





Arrange the card board to the windows of the hut. As Hot air passes through the bottle neck compresses and cools the air.

Our Blog



INSPIRE AWARD SCHEME: Online nomination for the year 2017-18 are now bei

ు గానీ వారి బోధనాభ్యసన కార్యక్రమాలకు వినియోగించుకోవచ్చును.

HELP LINE
8333890009
FROM 5 p.m TO 7 p.m

OUR PUBLICATIONS

Bit Analysis of Pre-Public Examinations : 2016-17

by K.V.Ramana & G.V.Ramaprasad

"This book provides you bits analysis of Pre-Public papers 2016-17 in Andhra Pradesh for Class X. This book helps to all the physical science learners."

Bit Analysis of Pre-Public Examinations : 2016-17

by K.V.Ramana & G.V.Ramaprasad

"This book provides you bits analysis of Pre-Public papers 2016-17 in Andhra Pradesh for Class X. This book helps to all the physical science learners."

Previous Question Paper Analysis : A.P & T.S

by K.V.Ramana & G.V.Ramaprasad

"This book provides you PREVIOUS PUBLIC PAPERS ANLYSIS. This is very useful to the public appearing students. From this book they easily access, which type of questions will ask in the upcoming public examination. They understand how the questions are twisted in CCE mode"

About this book

This book is meant for class X students in AP & TS.

In this we have given **CCE Notes** with full explanations of questions given in the lesson. They are very useful to understand clear concept. We also give all type of examples and applications at related topics so as to learn crystal clearly about that concept.

We give one **Project** and one **Lab Activity** in the given syllabus, explain a **DIY project/experiment** for doing the students at their home to enjoy the learning, include some **CCE Model Questions**, **CCE Bits** that are given previously in examinations for understanding the question pattern, publish a special article **"Bermuda triangle"** as a mystery of science, give a **mind map** for better learning, give a cross word to test the students their own, give a **Made Easy Concept** to learn easy, give **see it... do it...** for a special concept understanding.

We request the book readers please take the print out of the pages containing mind map and paste them one on the other to form a complete mind map.

Physical Science 4ever